

TC-134SD

E Model

(Serial No. 15,201 and later)

US Model

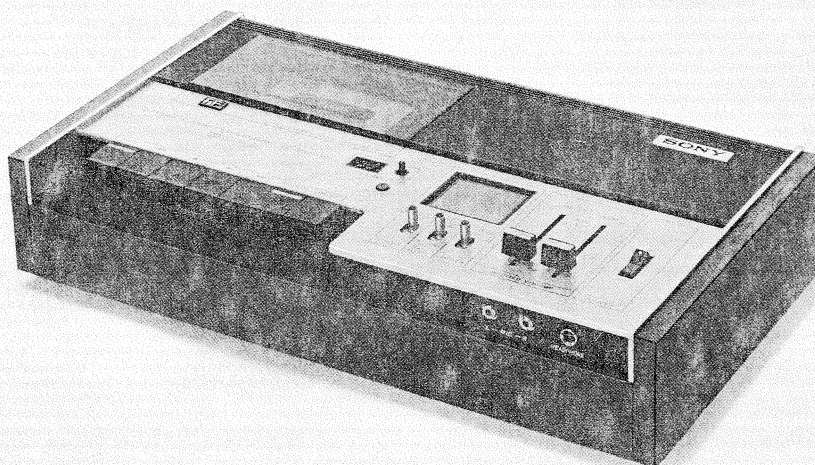
(Serial No. 15,501 and later)

AEP Model

(Serial No. 11,501 and later)

Canadian Model

AUS Model



STEREO CASSETTE-CORDER

SPECIFICATIONS

Power Requirements:	AC 100, 110, 120, 127, 220, 240 V 50/60 Hz (General Export) 110, 127, 220, 240V 50/60 Hz (AEP, AUS) 120V 60 Hz (USA, Canada)	Inputs:	Two MIC Inputs Impedance: low impedance Maximum sensitivity: 0.2 mV (-72 dB) Two LINE Inputs Impedance: 680 k Ω Maximum sensitivity: 62 mV (-22 dB) REC/PB connector (General Export, AEP, AUS) Impedance: 2.2 k Ω Level: -28 dB (31 mV)
Power Consumption:	10W (General Export) 18W (AEP, AUS) 15W (USA, Canada)	Outputs:	Two LINE OUTPUTS Impedance: 10 k Ω or more Level: 0.77 V (0 dB) with 100 k Ω load HEADPHONE output Impedance: 8 Ω load Level: 31 mV (-28 dB) REC/PB connector (General Export, AEP, AUS) Impedance: 8.2 k Ω Level: 0.69 V (-1 dB)
Track System:	Four-track two-channel stereo	Semiconductors:	30 transistors and 15 diodes
Tape:	SONY tape cassette or equivalent	Dimensions:	16 $\frac{1}{4}$ (W) x 4 $\frac{9}{16}$ (H) x 8 $\frac{25}{32}$ " (D) (412 x 115 x 223 mm)
Tape Speed:	1 $\frac{7}{8}$ ips (4.8 cm/s)	Weight:	9 lb 15 oz (4.8 kg)
Recording Time: (with C-120 tape cassette)	2.0 hrs total		
Frequency Response:	With chromium dioxide cassette NAB DIN 30~17,000 Hz 40~13,000 Hz With ordinary cassette 30~15,000 Hz		
Signal-to-Noise Ratio:	49 dB (DOLBY switch to OFF) (with DOLBY switch to ON, S/N ratio improves 5 dB at 1 kHz and 10 dB at 5 kHz)		
Wow and Flutter: (RMS weighted)	NAB DIN 0.2% $\pm 0.3\%$		
Recording Bias Frequency:	Approx. 85 kHz		

E Model = General Export Model

SONY
SERVICE MANUAL

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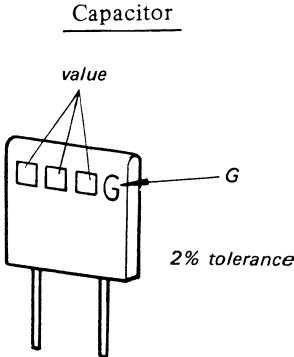
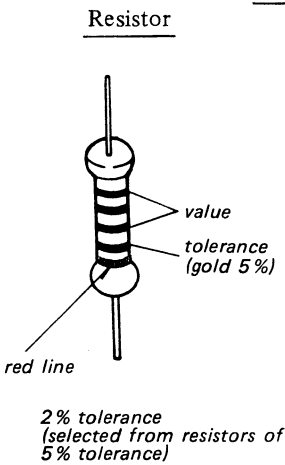
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When ordering replacement parts you should use PART NUMBER listed on the ELECTRICAL PARTS LIST or the EXPLODED VIEWS. The reference number should not be used for ordering purposes.

CAUTION

- 1. Record and playback level adjustments should be carefully performed. If the levels are not as specified, DOLBY circuit will not correctly operate.
- 2. When replacing resistors and capacitors specified 2% tolerance, use the specified ones. DOLBY system requires precise circuit operation.

2% Tolerance Identification



SECTION 1 OUTLINE

1-1. DOLBY NOISE REDUCTION SYSTEM

1. OUTLINE

The TC-134SD uses DOLBY NOISE REDUCTION system which reduces hissing noise heard during low level or zero level sound conditions. This system pre-emphasizes the low-level high-frequency recorded signals which hissing noise disturbs. During playback, it de-emphasizes these signals along with tape hiss and thus improves signal-to-noise ratio.

- (1) The DOLBY system differs from other noise reduction systems as follows:

- * High-fidelity sound cannot be obtained if the DOLBYRIZED sound is played back on other systems or vice versa.

- * Signal levels must be precisely adjusted since these levels control DOLBY system.

- (2) The DOLBY system of the TC-134SD has following features:

The DOLBY unit (DCB-010) contains a variable high-pass filter controlled by input level. During Record Mode:

The DOLBY unit (DCB-010) is series-connected to boost the low-level high-frequency signal.

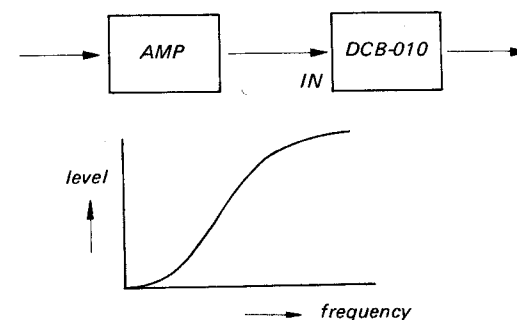


Fig. 1-1. Unit connection in record mode

During Playback Mode:

The DOLBY unit is connected as a negative feedback circuit to decrease the gain for low-level high frequency signals boosted in recording.

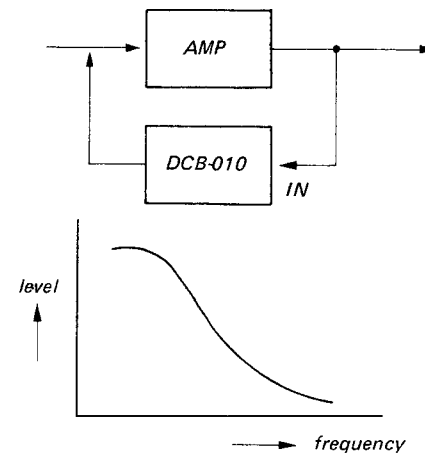
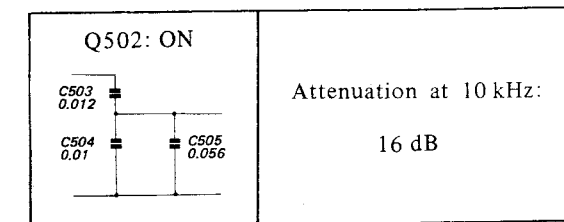
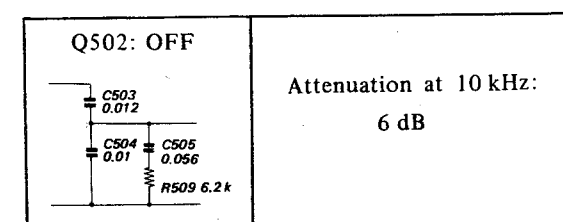


Fig. 1-2. Unit connection in playback mode

2. CIRCUIT OPERATION

(Referring to the schematic diagram on page 27, 28)

Stage/Control	Function
R501, R502	These resistors attenuate signal level 20 dB. High resistance value is due to high output impedance of LINE OUT jack and REC/PB connector (General Export, AEP and AUS), since DOLBY unit input is connected to LINE OUT jack.
Q501	This emitter-follower amplifier is an impedance-translator for the low-impedance high-pass filter.
filter C503, C504, C505 R509, Q502	Q502 changes the filter curve determined by C503, C504, C505 and R509.



Q502-control amplifier
Q505, Q506, Q507

This is a high gain (more than 50 dB) amplifier used to obtain flat frequency response. Normal input level of this amplifier is -56 dB (1.2 mV) at 1,000 Hz.

rectifier
D501, D502

These diodes performing as a voltage doubler rectify amplified signals to obtain a dc component greater than 1V.

C507

This capacitor prevents abnormal oscillation of high frequency signal. The capacitance value is small (6 pF) because the amplifier requires short attack time.

release time
C517, R534

C517 and R534 effect a release time about 10 m sec.

C515, R530

C515 and R530 connected to negative feedback circuit of Q502-control amplifier boost high frequency signal input attenuated by the filter.

C518, R537

For increasing-transient inputs, C518 and R537 reduce attack time to 25 μ sec. When signal level increases suddenly, attack time—time until DOLBY system begins to operate — causes a click noise due to over-shooting as shown in Fig. 1-3. To prevent the click noise, by-pass circuits are added. See Fig. 1-4.

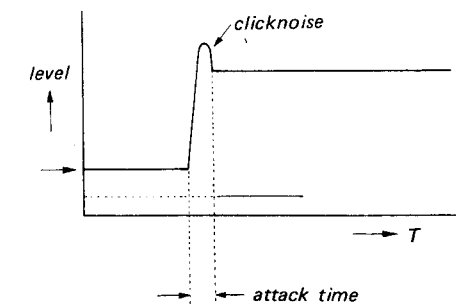


Fig. 1-3.

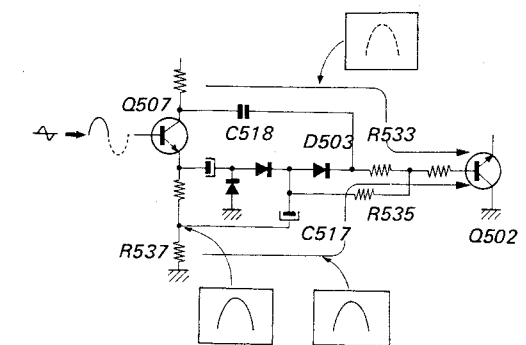


Fig. 1-4.

C513, R525

R525 is series-connected to by-pass capacitor C513 of Q505 emitter. R525 and a small value coupling-capacitor C512 decrease the control amplifier gain for low frequency.

flat amplifier
Q503, Q504

This stage amplifies output signals of the filter.

19-kHz trap
L501, L502

L501 and L502 trap 19 kHz pilot signal of FM multiplex signal and eliminate recording bias signal.

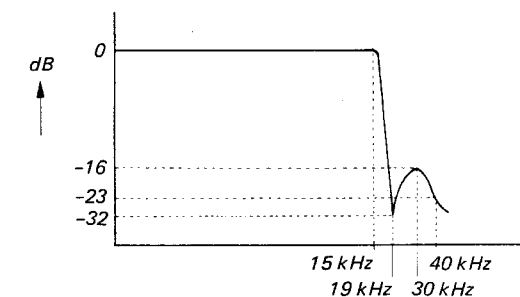


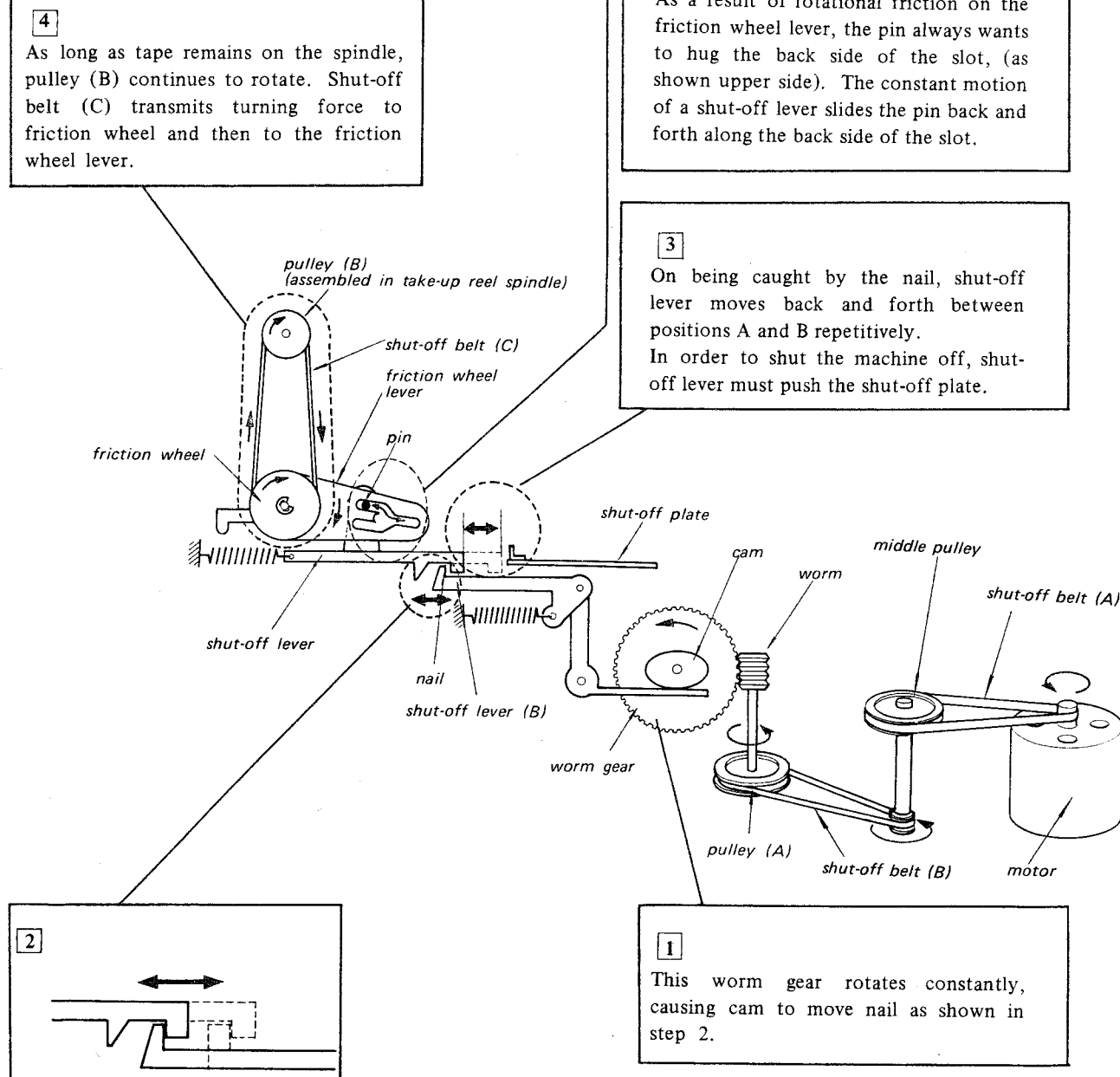
Fig. 1-5.

1-2. AUTOMATIC SHUT-OFF MECHANISM OPERATION

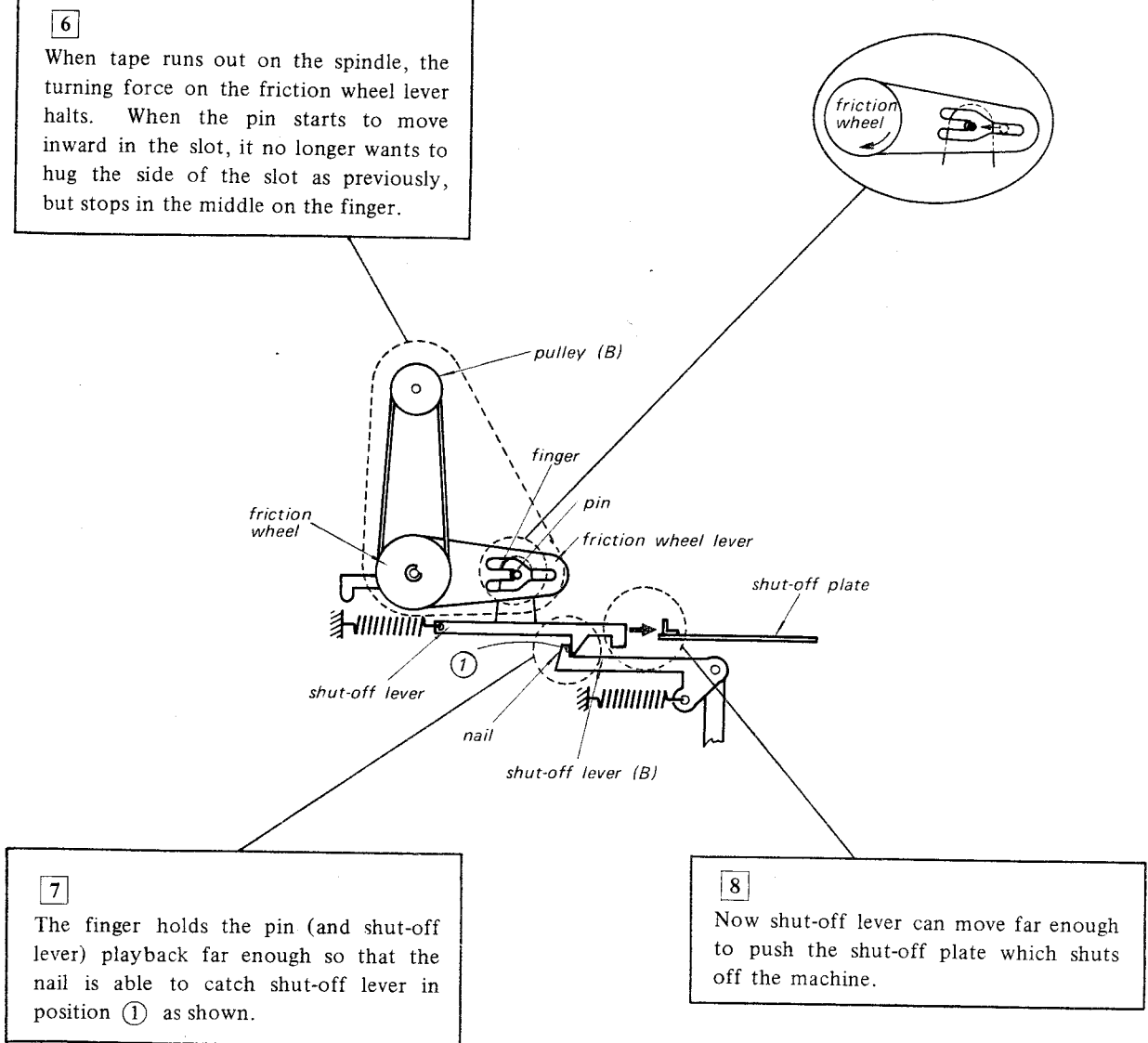
The TC-134SD mechanism is designed so that the unit will shut itself off automatically at tape end in any mode by detecting stop mode of pulley (B).

As an example, the mechanism operation in playback mode is illustrated step by step.

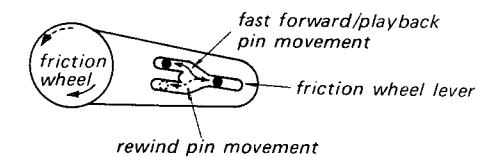
Playback — Normal Operation —



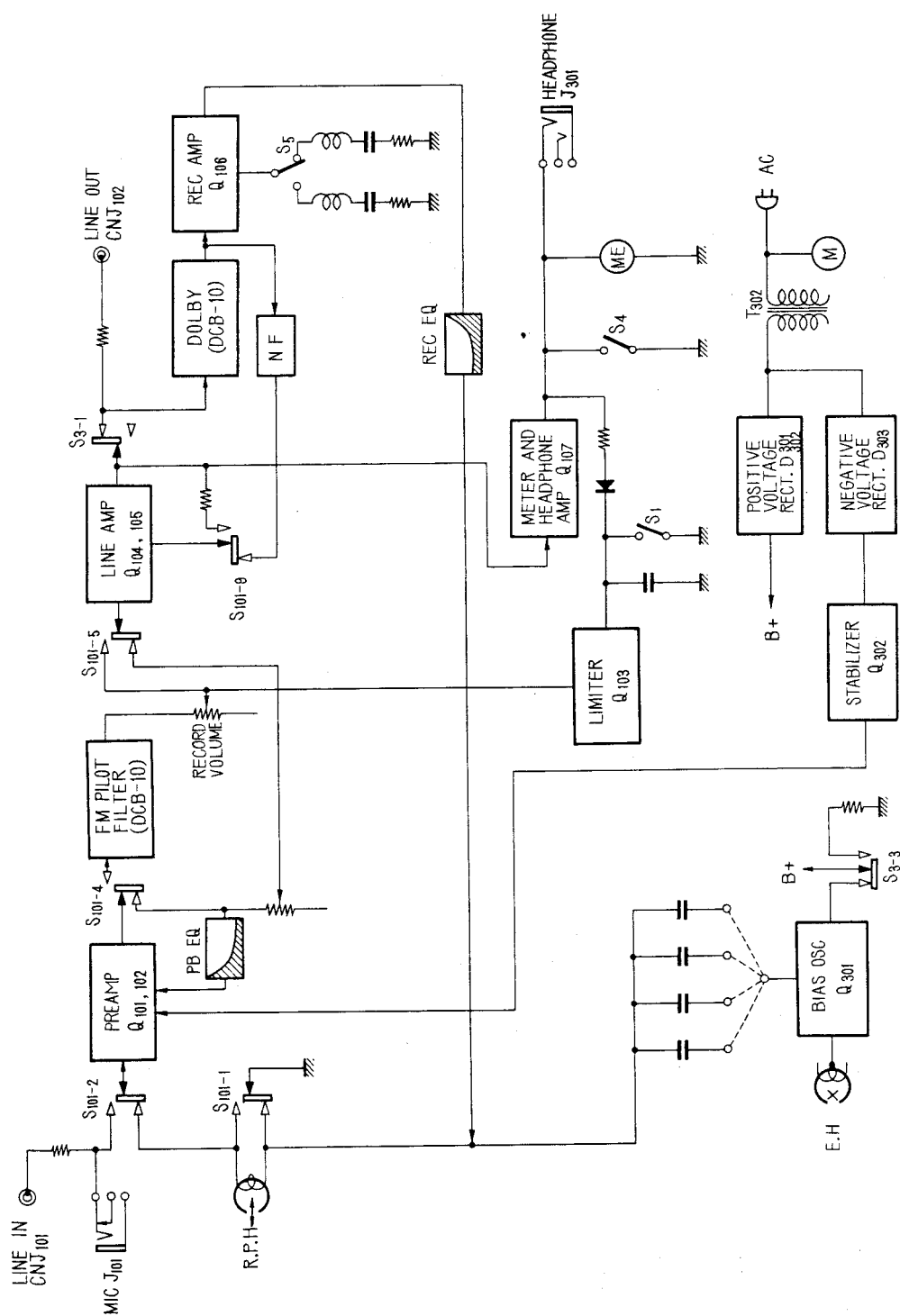
Playback — Automatic Shut-off Operation —



For fast forward, automatic operation is the same as for the playback mode. For rewind mode, the pin hugs the opposite side of the slot, as shown below.



1-3. BLOCK DIAGRAM

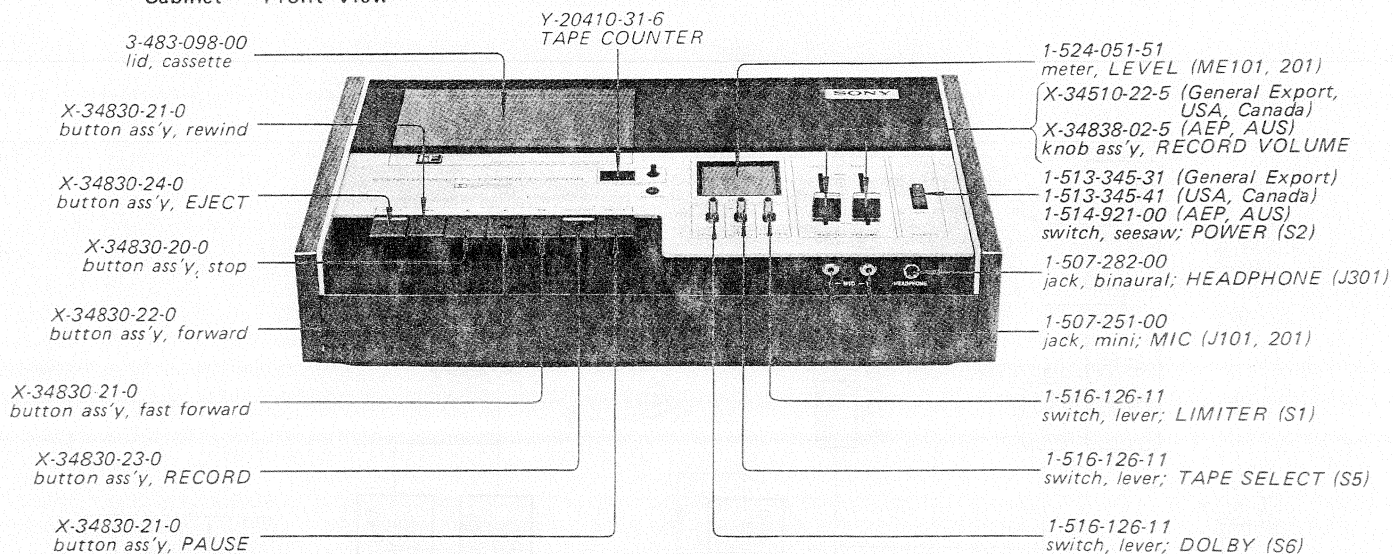


Note: Switch Mode

Ref. No.	Switch	Mode
S101	record/play back	play back
S1	LIMITER	OFF
S3	timing	play back
S4	muting	OFF
S5	TAPE SELECT	SPECIAL

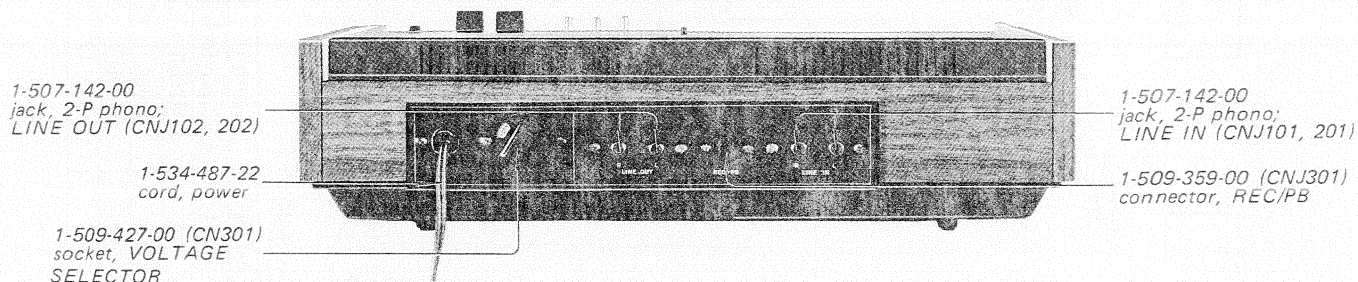
1-4. MAJOR PARTS LOCATIONS

Cabinet — Front View —

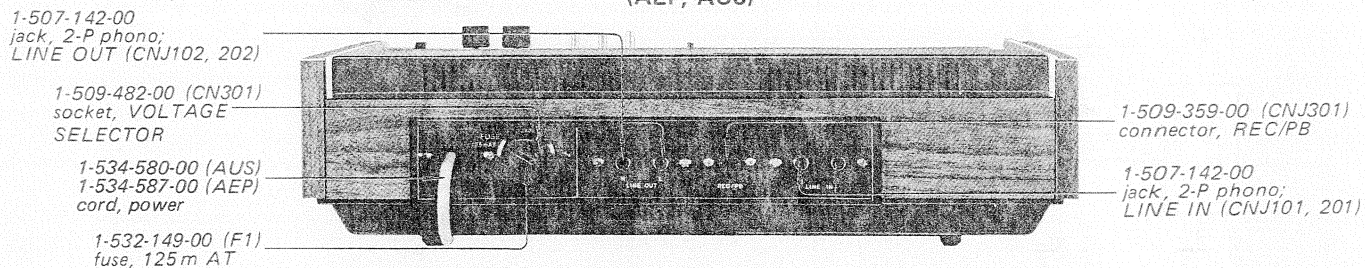


Cabinet — Rear View —

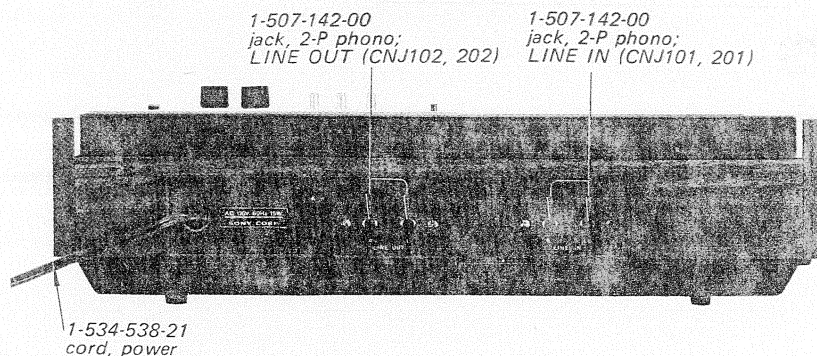
(General Export)



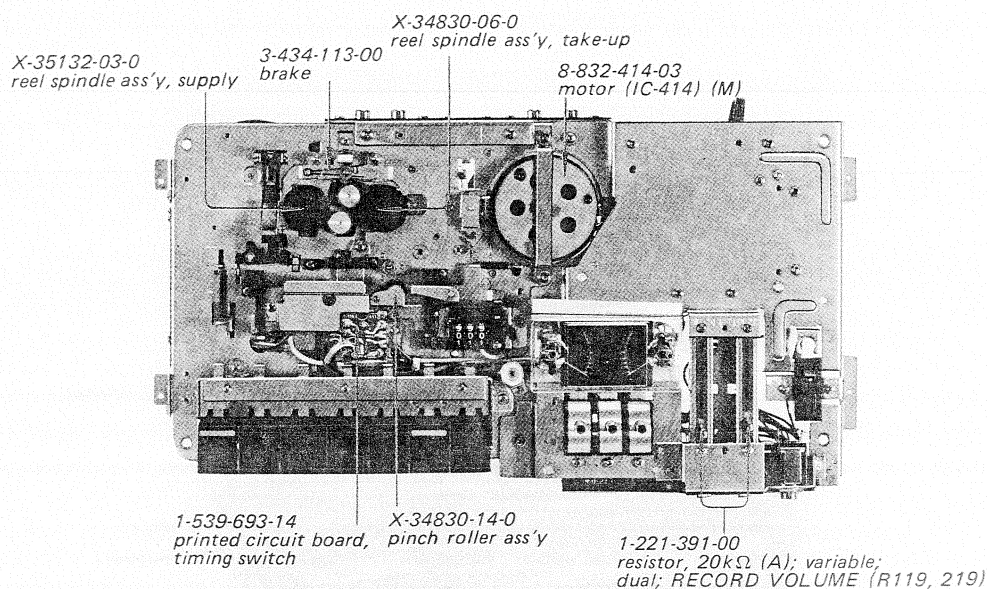
(AEP, AUS)



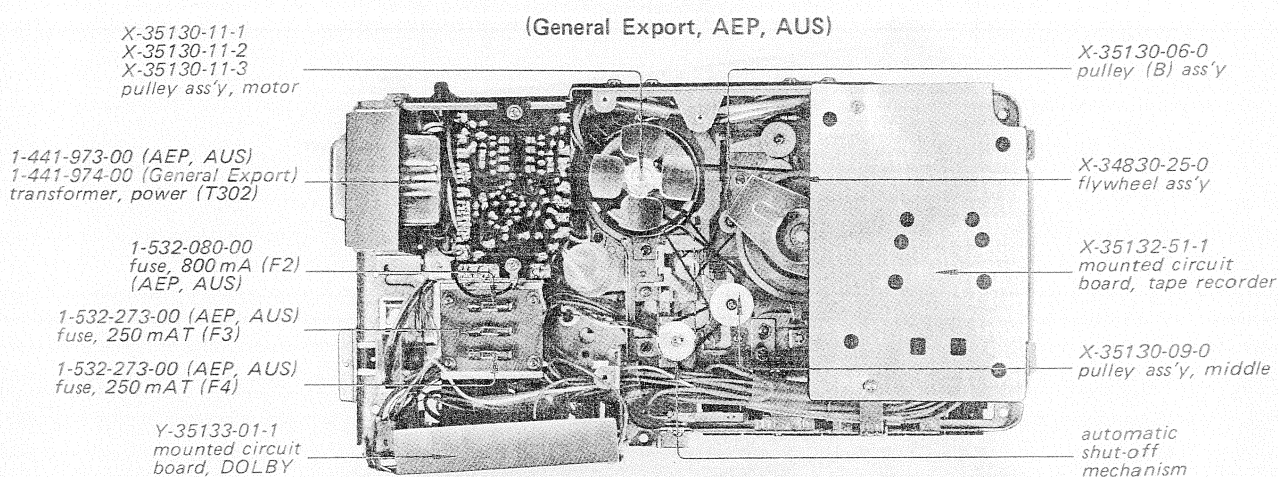
(USA, Canada)



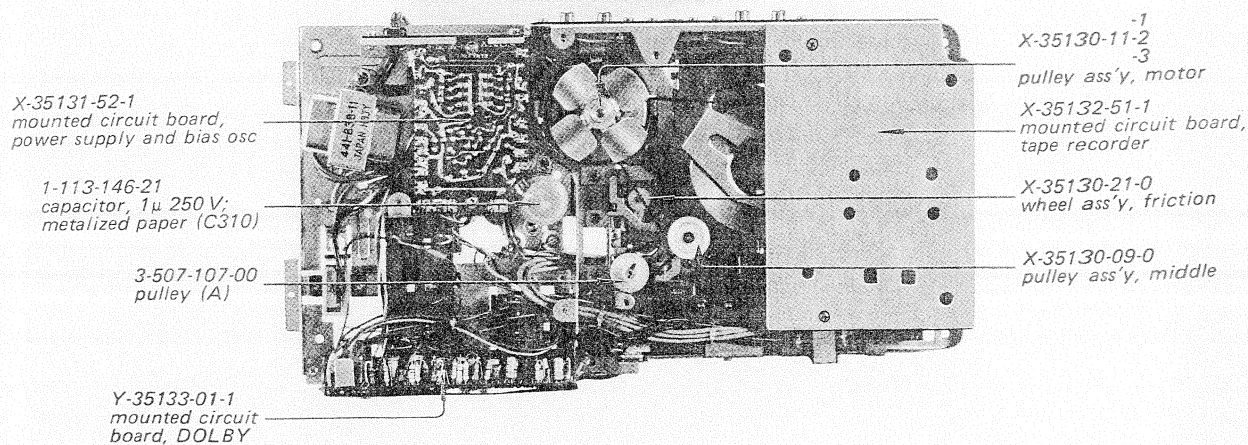
Chassis — Top View —



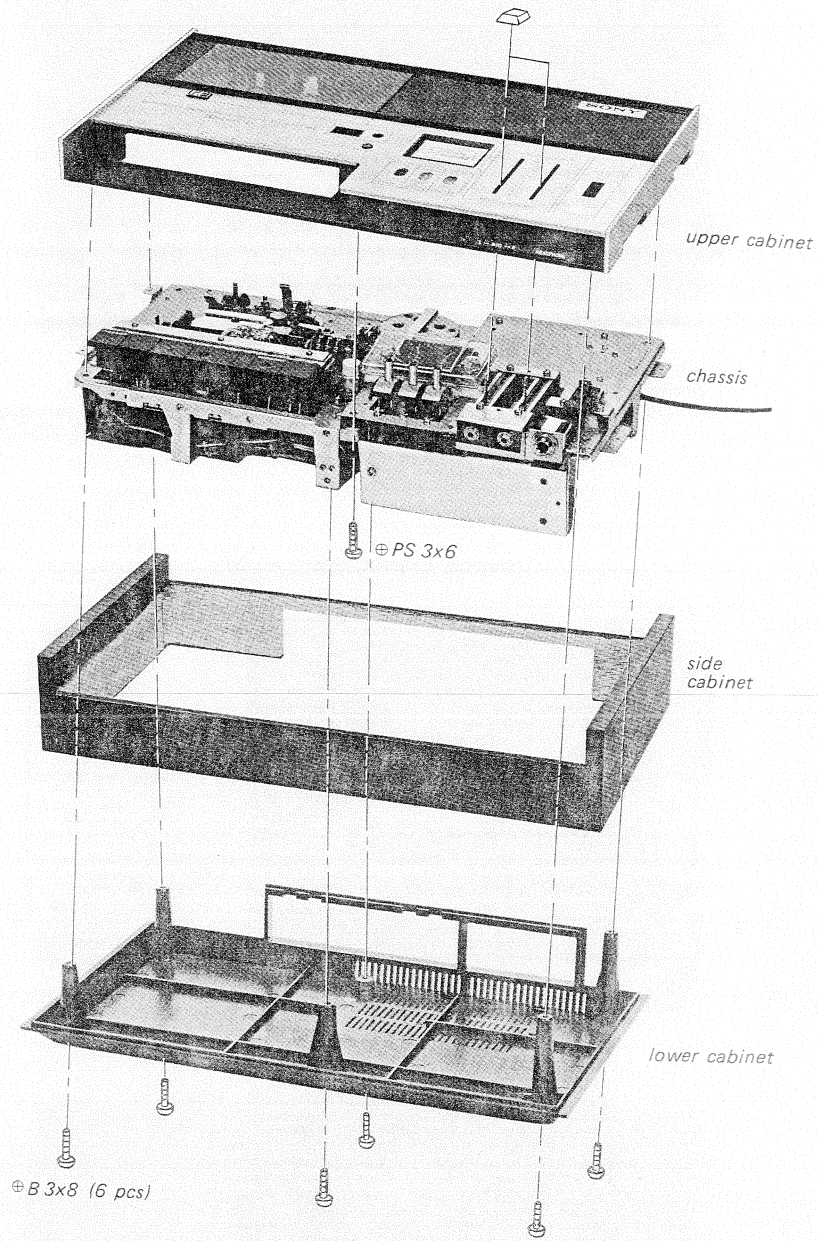
Chassis — Back View —



(USA, Canada)



SECTION 2 DISASSEMBLY

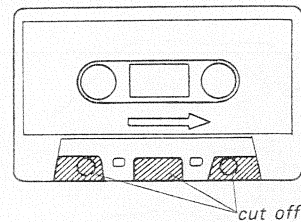


SECTION 3 ADJUSTMENTS

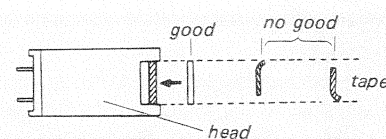
3-1. MECHANICAL ADJUSTMENT

Head Height Adjustment

Use a cassette shown below:



Adjust by replacing both spacers so that tape guide does not curl tape in playback mode.

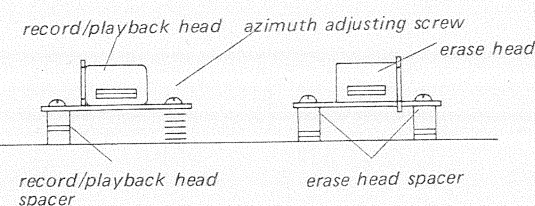
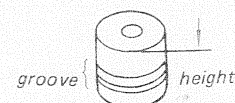


Record/playback Head

	Part No.	Groove	Height (mm)
Record/play-back Head Spacer	3-513-235-01	0	3.8
	3-513-235-11	1	3.9
	3-513-235-21	2	4.0
	3-513-235-31	3	4.1
	3-513-235-41	4	4.2

Erase Head

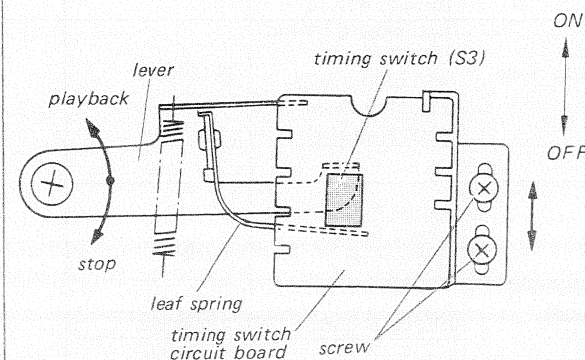
	Part No.	Groove	Height (mm)
Erase Head Spacer	3-483-111-01	0	5.6
	3-483-111-11	1	5.7
	3-483-111-21	2	5.8
	3-483-111-31	3	5.9
	3-483-111-41	4	6.0



Timing Switch (S3) Adjustment

— in playback mode —

Loosen screws and adjust timing switch circuit board position so that the lever turns timing switch ON.

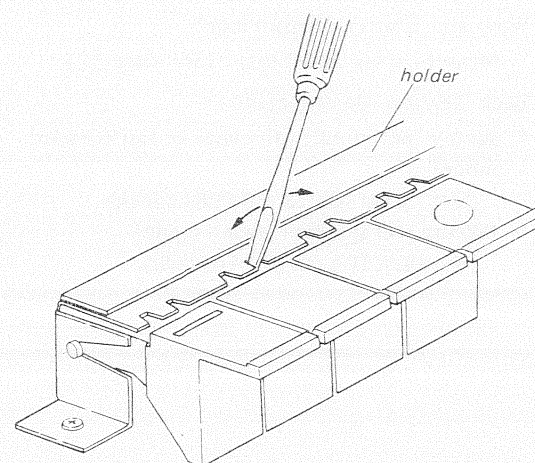


When changing unit from record mode to stop mode, ensure that the lever turns off timing switch before record/playback switch is changed to playback position.

Button Height Adjustment

— in stop mode —

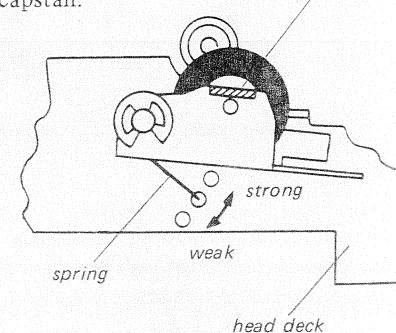
Bend up or down tongued portion of the holder so that each button is at the same height.



Pinch Roller Pressure Adjustment

— in playback mode —

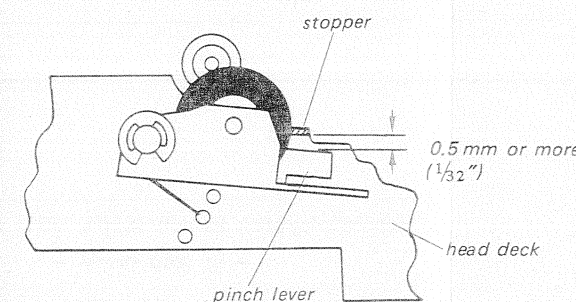
Adjust by changing the hooking position of the spring so that spring scale reads 300 ~ 400 g (10 ~ 14 oz) when the pinch roller departs from the capstan.



Pinch Roller Position Adjustment

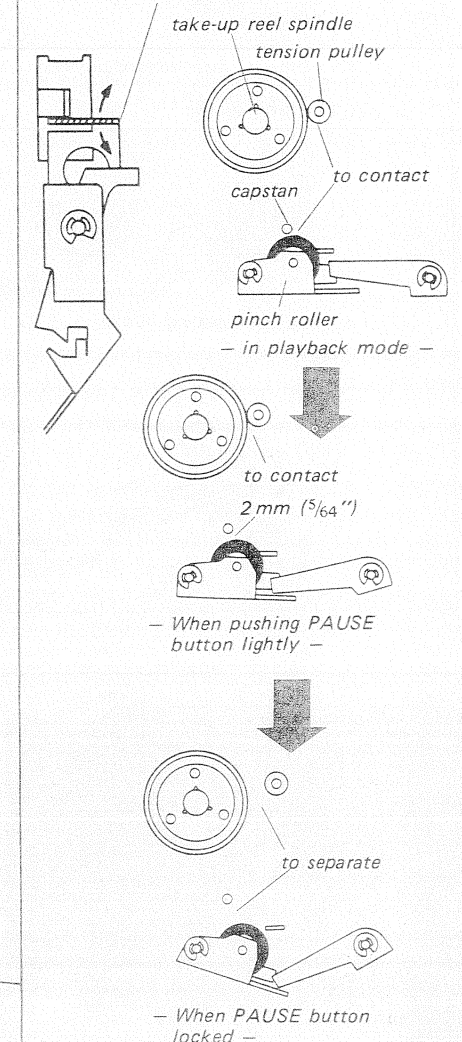
— in playback mode —

Adjust by bending stopper for the clearance shown:



PAUSE Timing Adjustment

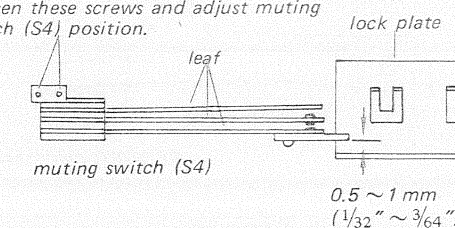
Adjust by bending here. (PAUSE lever A)



Muting Switch (S4) Adjustment

— in stop mode —

Loosen these screws and adjust muting switch (S4) position.

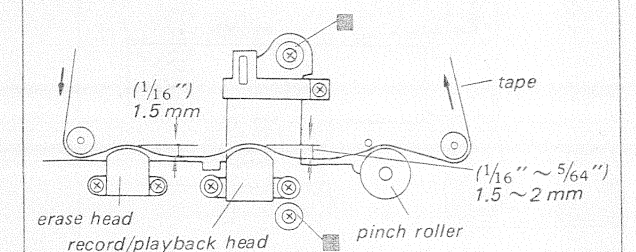


When RECORD button is pushed in playback mode, ensure that the switch (S4) is not turned on by play of RECORD button.

Head Deck Position Adjustment

— in playback mode —

Use a cassette provided for head height adjustments. Loosen screws (■) and adjust head deck position as shown:

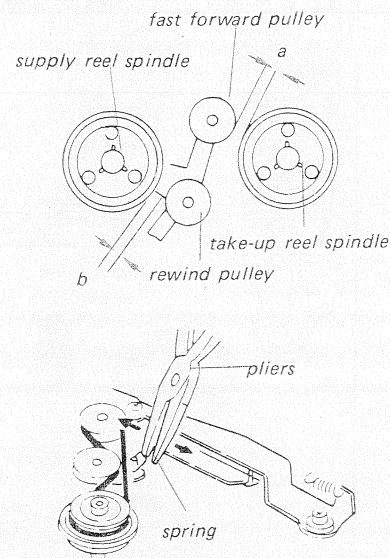


Fast Forward/Rewind Pulley Adjustments

— in stop mode —

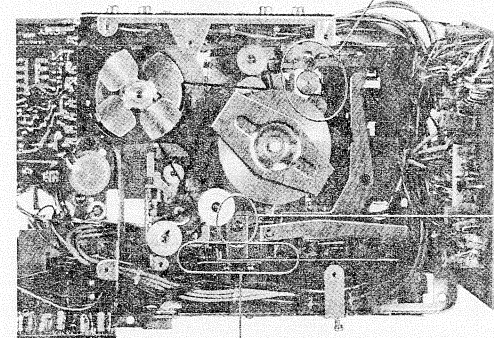
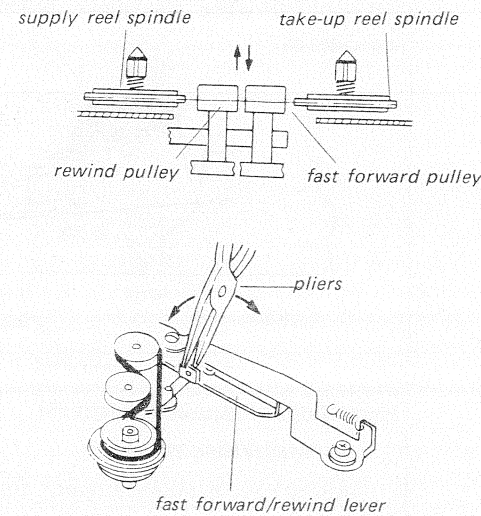
Pulley Clearance Adjustment

Adjust by bending the spring so that the clearance "a" is equal to "b"



Pulley Height Adjustment

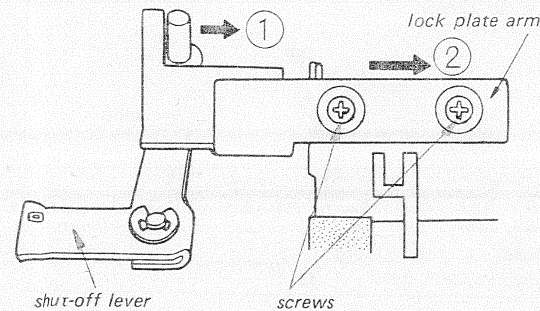
Adjust pulley height by bending fast forward/rewind lever as shown:



Lock Plate Arm Adjustment

— in stop mode —

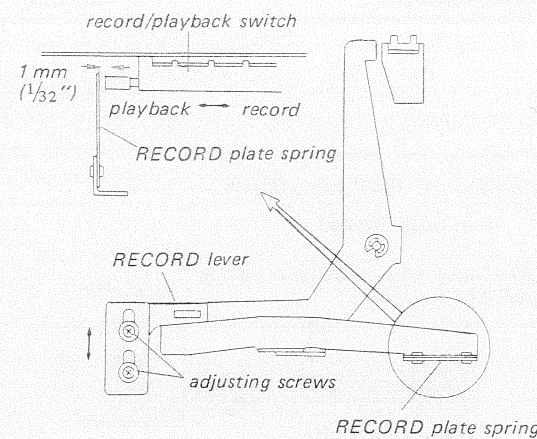
With shut-off lever fully pushed in the direction shown by the arrow ①, loosen screws and lock plate arm fully pushes in the direction shown by the arrow ②.



Record/playback Switch (S101, 201) Adjustment

— in stop mode —

Loosen screws and adjust RECORD lever position.



When depressing RECORD button, ensure that record/playback switch is set to record position. When depressing RECORD button in playback mode, ensure that record/playback switch is not changed over.

CHECKS AFTER MECHANICAL ADJUSTMENTS

- After the mechanical adjustments, perform the following operation checks with a cassette loaded.

Mode	Depress	Remarks
stop mode	forward button fast forward button rewind button RECORD button PAUSE button EJECT button	possible
playback mode	fast forward button rewind button stop button PAUSE button	possible
	RECORD button	impossible
	EJECT button	impossible (cassette lid opened)
fast forward mode	RECORD button forward button rewind button stop button EJECT button	possible
rewind mode	RECORD button forward button fast forward button stop button EJECT button	possible
record mode	fast forward button rewind button stop button PAUSE button	possible
	EJECT button	impossible (cassette lid opened)
pause mode	PAUSE button	changed back to initial mode

- Wow and Flutter Measurement

Measure wow and flutter (See page 22)

- Back Tension Measurement

* supply reel spindle (playback or fast forward mode)

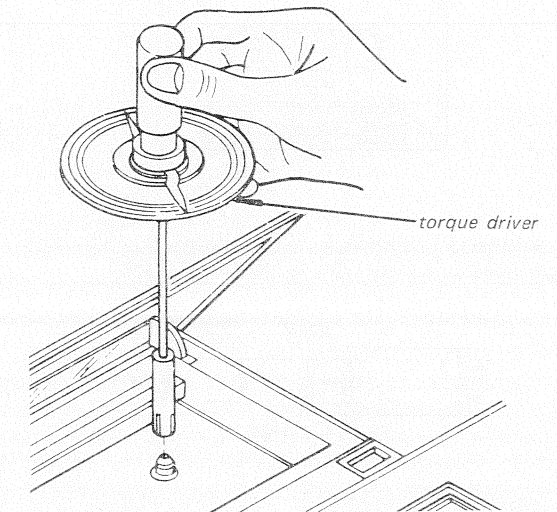
2 ~ 7 g·cm (0.028 ~ 0.098 oz·inch)

* take-up reel spindle (rewind mode)

less than 10 g·cm (0.14 oz·inch)

- Torque Measurement

forward torque 45 ~ 65 g·cm
(0.63 ~ 0.91 oz·inch)
fast forward torque 80 ~ 110 g·cm
(1.12 ~ 1.54 oz·inch)
rewind torque 85 ~ 115 g·cm
(1.19 ~ 1.61 oz·inch)



- Function Time of Auto Shut-off Mechanism

This mechanism should stop tape motion within 10 seconds after tape has come to the end.

- Clean the following parts with soft cloth dampened with denatured alcohol.
belts, idlers, tires of reel spindles, pinch roller, capstan

3-2. ELECTRICAL ADJUSTMENTS/ MEASUREMENTS

Precaution:

1. Clean the following parts with an alcohol moistened swab:
 - * record/playback head
 - * erase head
 - * capstan
 - * pinch roller
 - * rubber belts
 - * idlers
2. Demagnetize record/playback head with a head demagnetizer.
3. Do not use magnetized screwdriver for adjustments.
4. After adjustments, apply locking paint to the parts adjusted.
5. Adjustments should be performed in the order arranged in this service manual.
6. Adjustments and measurements should be performed for both L-CH and R-CH with rated power supply voltage unless otherwise specified.
7. Record and playback level adjustments should be carefully performed. In case the levels are not as specified, DOLBY circuit will not correctly operate.

Test Equipment/Tools Required:

audio oscillator (af osc)
VTVM
digital frequency counter
oscilloscope
wow meter
1-kHz bandpass filter
attenuator ($600\ \Omega$)
non-magnetic screwdriver
blank tape cassette (completely erased with bulk eraser); C-60HF
resistors $100\ k\Omega$ ($\frac{1}{4}W$), $600\ k\Omega$ ($\frac{1}{4}W$)
 $300\ \Omega$ ($\frac{1}{4}W$), $10\ k\Omega$ ($\frac{1}{4}W$)
SONY test tapes
SPC-4 (1 kHz, 0 dB)
WS-48 (3 kHz, 0 dB)
P-4-L81 (333 Hz, 0 dB)
P-4-A81 (6.3 kHz, -10 dB)

Normal Input Level

	MIC	LINE IN
impedance	300 Ω	10 k Ω
input level	-60 dB (0.78 mV)	-10 dB (0.25 V)

Normal Output Level

	LINE OUT
load impedance	100 k Ω
output level	0 dB (0.77 V)

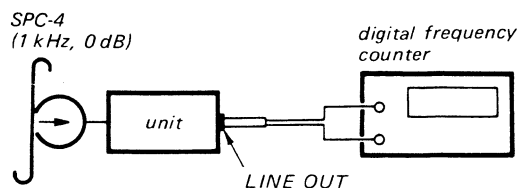
1. Tape Speed Adjustment

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

Procedure:

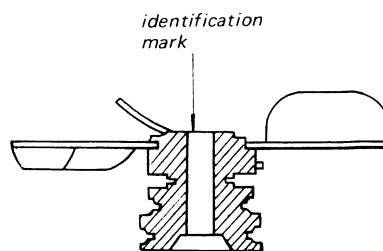
1. Mode: Playback



Specification: 970 ~ 1,030 Hz

Frequency difference between beginning and end is within 10 Hz.

2. If necessary, change motor pulley as follows:



Part No.	Identification Mark	Tape Speed
X-35130-11-1	1	lower
X-35130-11-2	2	standard
X-35130-11-3	3	higher

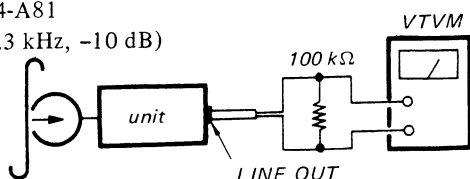
2. Head Azimuth Adjustment

Control/Switch Setting:

LIMITER switch: OFF
 TAPE SELECT switch: NORMAL
 DOLBY switch: OFF

Procedure:

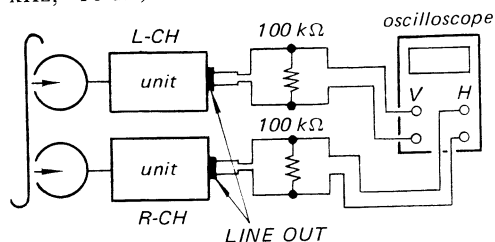
- Mode: Playback
 P-4-A81
 (6.3 kHz, -10 dB)



2.

Adjust	VTVM reading	Remarks
azimuth adjusting screw	biggest peak	If the azimuth angles of L-CH and R-CH are not the same, set the screw midway between two screw positions.

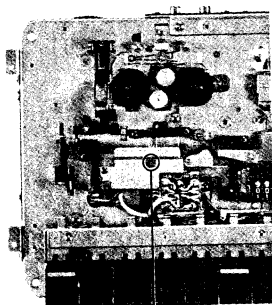
- Mode: Playback
 P-4-A81
 (6.3 kHz, -10 dB)



4.

Adjust	On the oscilloscope
azimuth adjusting screw	

Adjustment Location:



azimuth adjusting screw

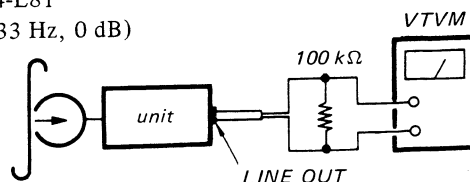
3. Playback Level Adjustment

Control/Switch Setting:

LIMITER switch: OFF
 TAPE SELECT switch: NORMAL
 DOLBY switch: OFF

Procedure:

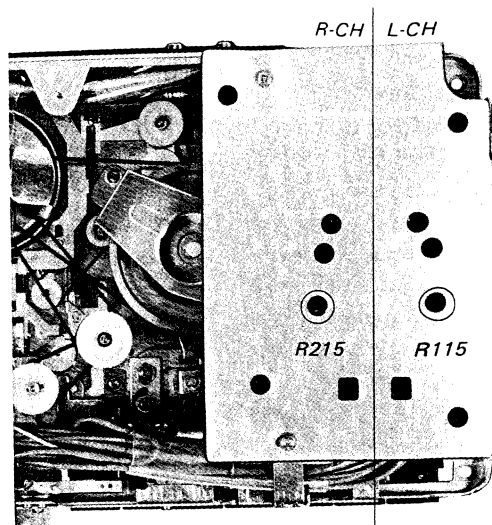
- Mode: Playback
 P-4-L81
 (333 Hz, 0 dB)



2.

Adjust	VTVM reading	Remarks
R115 R215	0 dB (0.77 V)	1. Allowance: within ± 1 dB 2. Level difference between the L-CH and R-CH should be within 1 dB.

Adjustment Location:



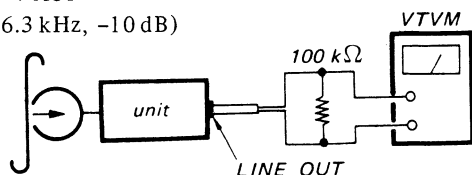
4. Playback Equalizer Adjustment

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

Procedure:

1. Mode: Playback
P-4-A81
(6.3 kHz, -10 dB)

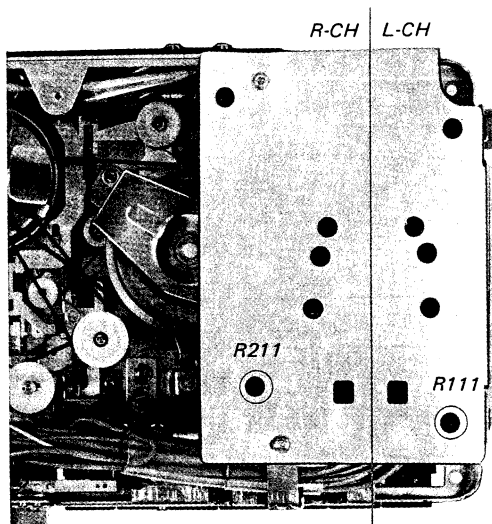


2.

Adjust	VTVM reading	Remarks
R111 R211	-10 dB (0.25 V)	1. Allowance: within ± 3 dB

3. DOLBY switch: ON
Ensure the level decreases 1 dB

Adjustment Location:



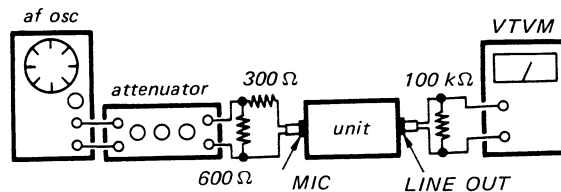
5. LEVEL Meter Calibration

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

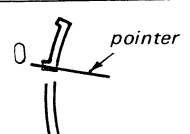
Procedure:

1. Mode: Record
333 Hz, -60 dB (0.78 mV)

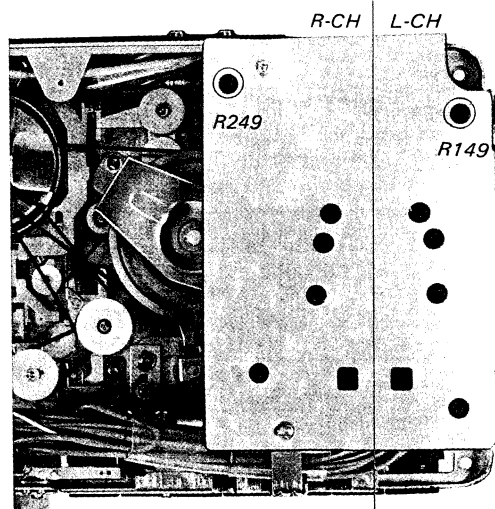


2. Set RECORD VOLUME control for 0 dB (0.77 V) VTVM reading.

3.

Adjust	LEVEL meter reading
R149 R249	

Adjustment Location:



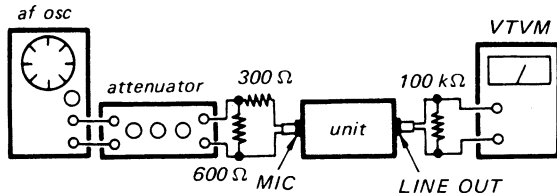
6. Record Bias Adjustment

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

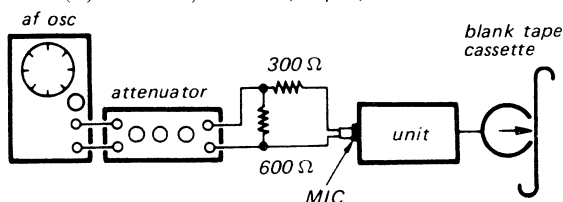
Procedure:

1. Mode: Record
1 kHz, -60 dB (0.78 mV)

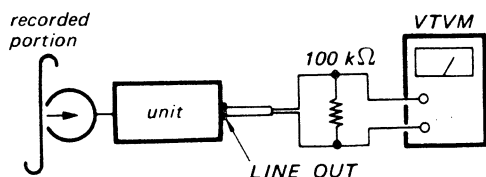


2. Set RECORD VOLUME control for 0 dB (0.77 V) VTVM reading.

3. Mode: Record
(1) 1 kHz, -90 dB (25 μ V)
(2) 7.5 kHz, -90 dB (25 μ V)



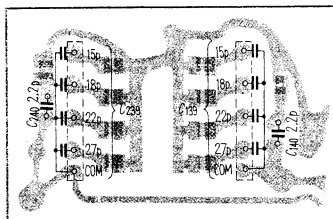
4. Mode: Playback



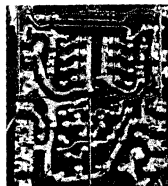
Adjust	VTVM reading
C139 C239 C140 C240	1 kHz level = 7.5 kHz level Allowance: within ± 1 dB

Level	Capacitance Value
7.5 kHz > 1 kHz	increase
7.5 kHz < 1 kHz	decrease

Adjust by soldering.



power supply
bias osc circuit
board



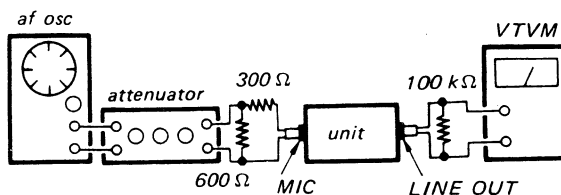
7. Record Level Adjustment

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

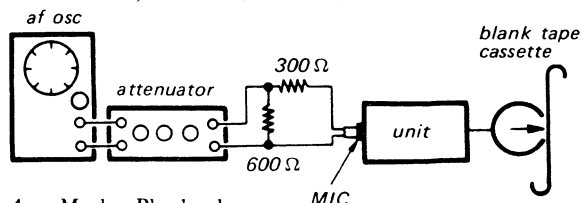
Procedure:

1. Mode: Record
333 Hz, -60 dB (0.78 mV)

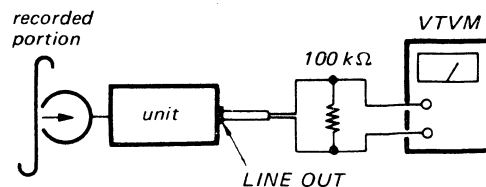


2. Set RECORD VOLUME control for 0 dB (0.77 V) VTVM reading.

3. Mode: Record
333 Hz, -60 dB (0.78 mV)



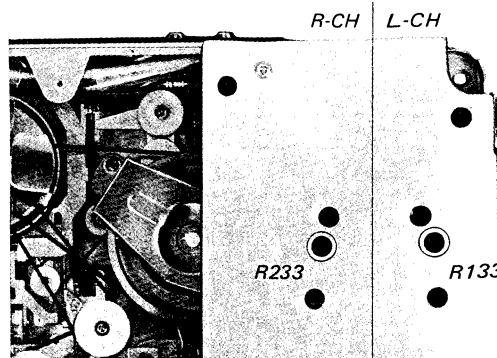
4. Mode: Playback



5.

Adjust	VTVM reading	Remarks
R133 R233	0 dB (0.77 V)	Allowance: within ± 1 dB

Adjustment Location:



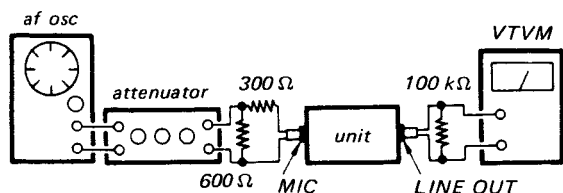
8. Overall Signal-to-noise Ratio Measurement

Control/Switch Setting:

LIMITER switch: OFF
 TAPE SELECT switch: NORMAL
 DOLBY switch: OFF

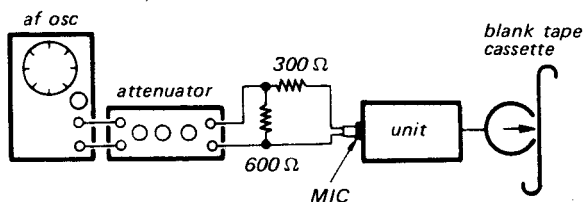
Procedure:

1. Mode: Record
 333 Hz, -60 dB (0.78 mV)



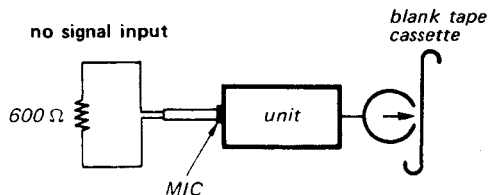
2. Set RECORD VOLUME control for 0 dB (0.77V) VTVM reading.

3. Mode: Record
 333 Hz, -60 dB (0.78 mV)

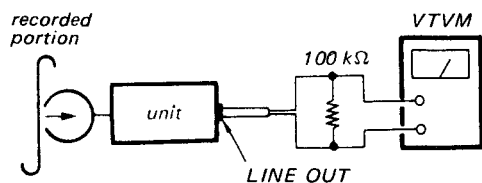


4. Mode: Record

no signal input



5. Mode: Playback



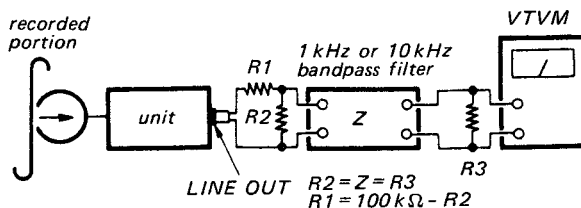
Play back	VTVM reading
333 Hz	0 dB (0.77 V)
no signal	less than -43 dB (5.49 mV)

6. Measure S/N ratio for 1 kHz and 10 kHz signals through 1 kHz and 10 kHz bandpass filters respectively according to Step 1 to 5.

Mode: record

Same as Steps 3 and 4.

Mode: playback



7. With DOLBY switch set to ON position, perform Step 6.
8. Ensure that DOLBY system improves S/N ratio. S/N ratio should be improved:
 5 dB or more at 1 kHz
 8 dB or more at 10 kHz

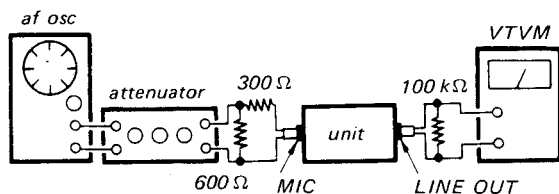
9. Erase Ratio Measurement

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

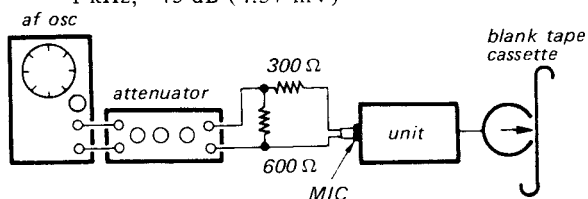
Procedure:

1. Mode: Record
1 kHz, -60 dB (0.78 mV)

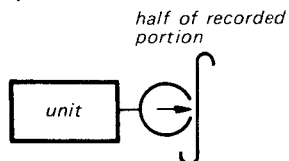


2. Set RECORD VOLUME control for 0 dB (0.77V) VTVM reading.

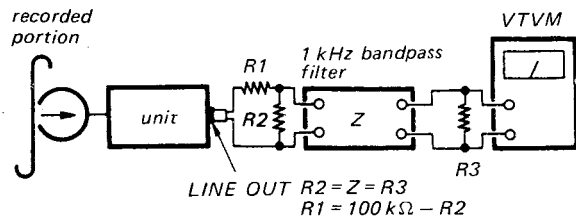
3. Mode: Record
1 kHz, -45 dB (4.37 mV)



4. Rewind half of recorded portion.
5. Set the RECORD VOLUME control to MIN position.
6. Mode: Record
no signal input



7. Mode: Playback



Play back	VTVM reading
1 kHz	level difference: greater than 60 dB
no signal	

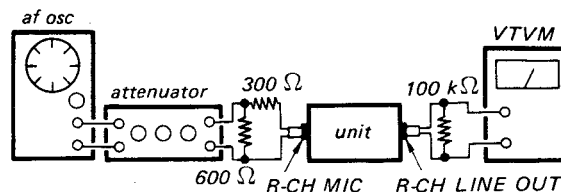
10. Cross-talk Measurement (between channels)

Control/Switch Setting:

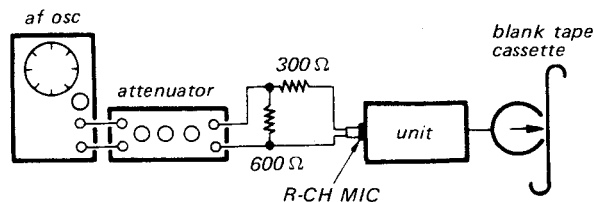
LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

Procedure:

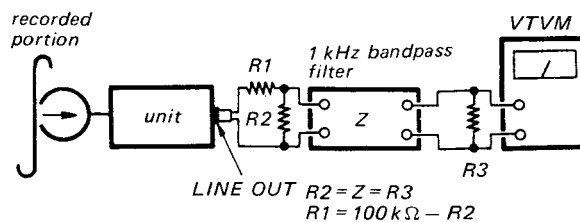
1. Mode: Record
1 kHz, -60 dB (0.78 mV)



2. Set R-CH RECORD VOLUME control for 0 dB (0.77V) VTVM reading.
3. Set L-CH VOLUME control to the same as R-CH VOLUME position.
4. Terminate L-CH MIC jack with 600 ohm resistor.
5. Mode: Record
1 kHz, -60 dB (0.78 mV)



6. Mode: Playback

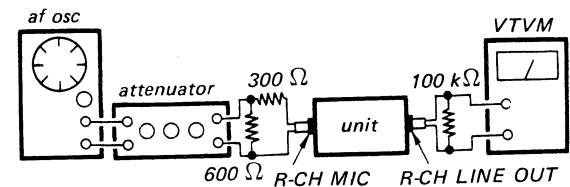


Play back	VTVM reading
R-CH (1 kHz)	level difference: greater than 25 dB
L-CH (no signal)	

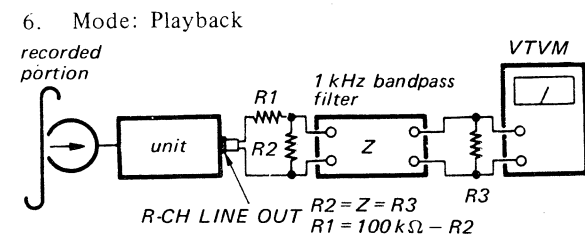
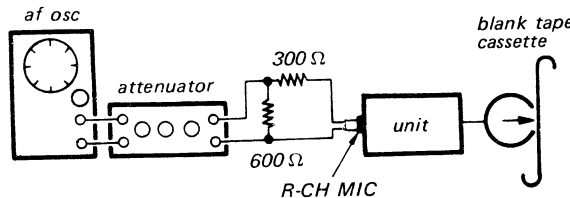
11. Cross-talk Measurement
(between tracks)

Control/Switch Setting:
LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

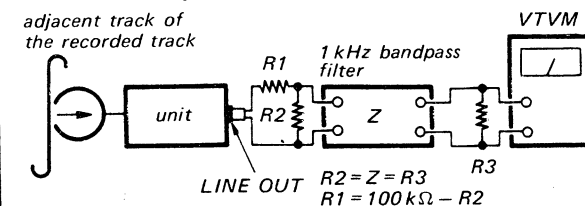
- Procedure:
1. Mode: Record
1 kHz, -60 dB (0.78 mV)



2. Set R-CH RECORD VOLUME control for 0 dB (0.77V) VTVM reading.
3. Set L-CH VOLUME control to the same as R-CH VOLUME position.
4. Terminate L-CH MIC jack with 600 ohm resistor.
5. Mode: Record
1 kHz, -60 dB (0.78 mV)



7. Turn the cassette over.
8. Mode: Playback
adjacent track of the recorded track

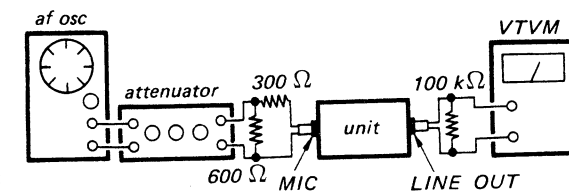


Play back	VTVM reading
1 kHz	level difference: greater than 60 dB
adjacent track of the recorded track	

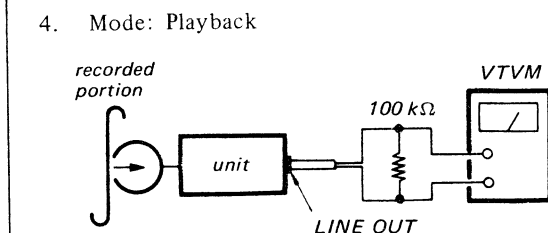
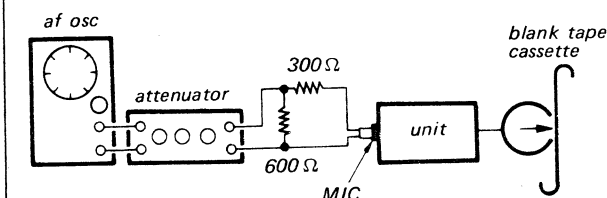
12. Overall Frequency Response Measurement

Control/Switch Setting:
LIMITER switch: OFF
TAPE SELECT switch: NORMAL

- Procedure:
1. Mode: Record
333 Hz, -60 dB (0.78 mV)



2. Set RECORD VOLUME control for 0 dB (0.77V) VTVM reading.
3. Mode: Record
333 Hz, -90 dB (24.5 uV)
40 Hz, -90 dB (24.5 uV)
70 Hz, -90 dB (24.5 uV)
600 Hz, -90 dB (24.5 uV)
5 kHz, -90 dB (24.5 uV)
10 kHz, -90 dB (24.5 uV)
15 kHz, -90 dB (24.5 uV)

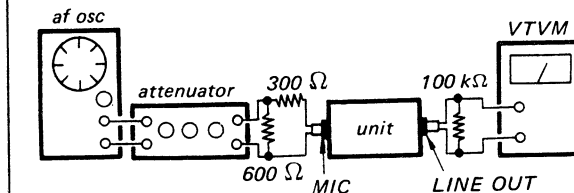


Play back	Output level difference	
	(DOLBY switch: ON)	(DOLBY switch: OFF)
333 Hz	0 dB	0 dB
40 Hz	-15 dB	-15 dB
70 Hz	±3 dB	±3 dB
600 Hz	±3 dB	±3 dB
5 kHz	±4 dB	±1.5 dB
10 kHz	±6 dB	±1.5 dB
15 kHz	-10 dB	-10 dB

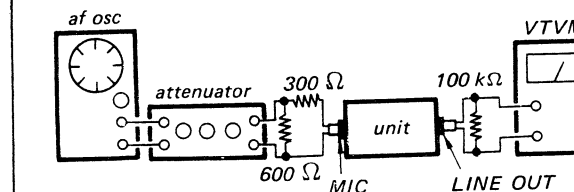
13. DOLBY Trap Coil Adjustment

Control/Switch Setting:
LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: ON

- Procedure:
1. Mode: Record
333 Hz, -60 dB (0.78 mV)

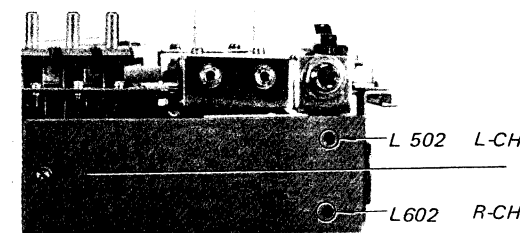


2. Set RECORD VOLUME control for 0 dB (0.77V) VTVM reading.
3. Mode: Record
19 kHz, -60 dB (0.78 mV)



Adjust	VTVM reading
L502	minimum
L602	

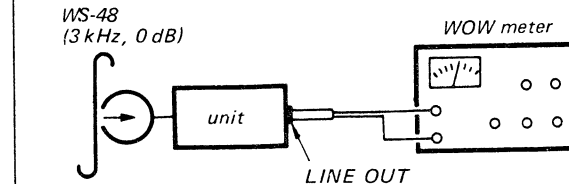
Adjustment Location:



14. Wow and Flutter Measurement

Control/Switch Setting:
LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

- Procedure:
1. Mode: Playback
WS-48 (3 kHz, 0 dB)

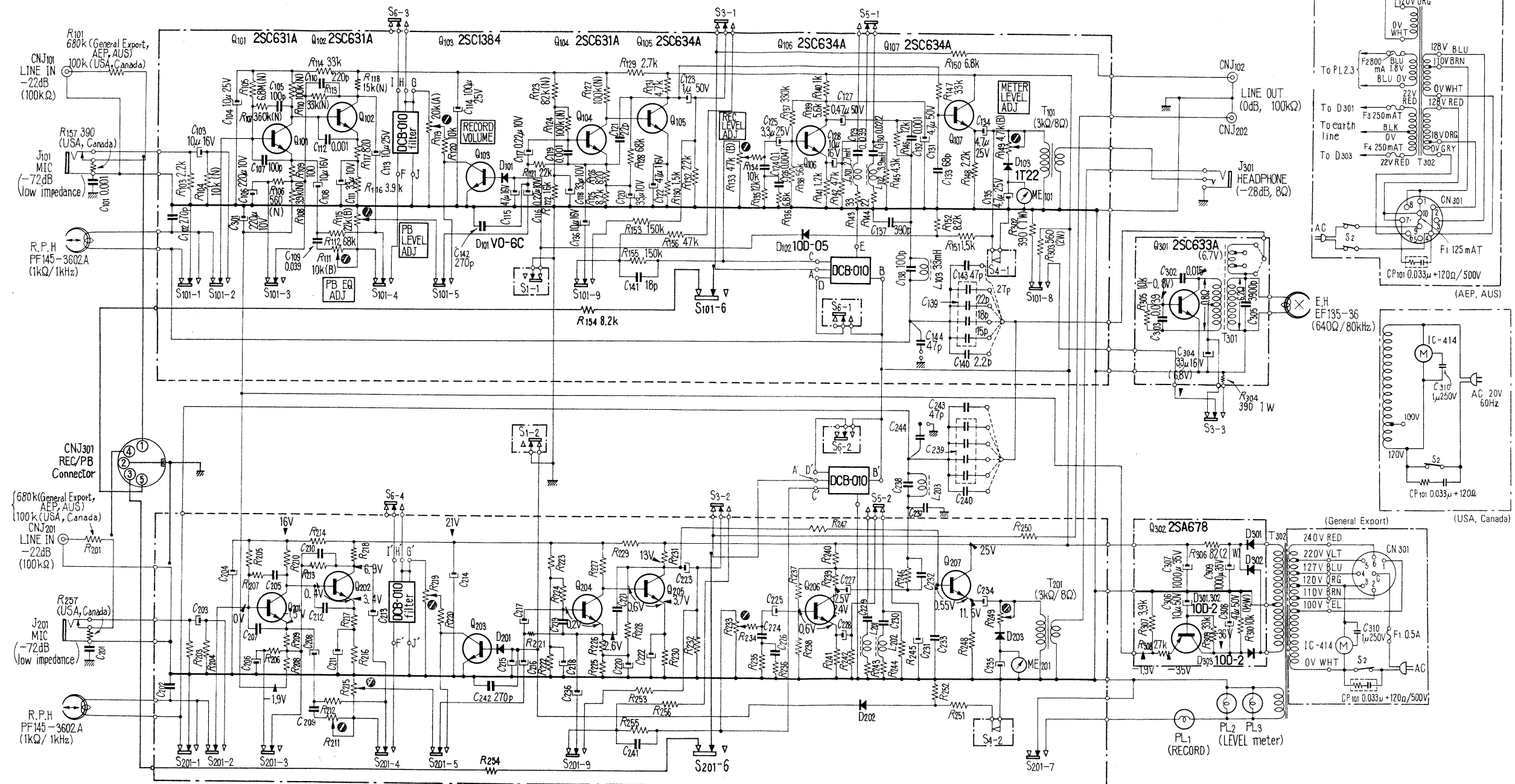


Specification: 3% (RMS)
Note: Measure wow and flutter for beginning, midway and end portion of tape (WS-48).

SECTION 4 DIAGRAMS

4-1. SCHEMATIC DIAGRAM

Tape Recorder Circuit

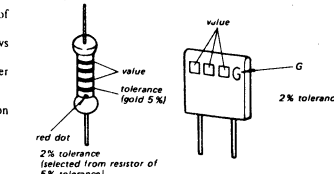


Green line circuit : General Export, AEP, AUS

Note:

- All resistors and capacitors are rated in Ω and μF unless otherwise indicated.
- ∞ indicates grounded to chassis.
- The letters (A) and (B) suffixed to rating value of variable resistor indicate its characteristics.
- The letter (N) which is suffixed to rating values shows a low-noise resistor.
- Voltage values shown are measured with a voltmeter (20 k Ω/V) in playback mode. Voltage values in parentheses are for record mode. Variations may be noted because of normal production tolerances.
- Voltage values for LCH is the same as for R-CH.
- $\odot$: adjustable
- Components for R-CH are the same value as for L-CH.

- When replacing resistors and capacitors specified with 2% tolerance, use the specified ones, since DOLBY system requires precise circuit operation.
- Tolerance Identification



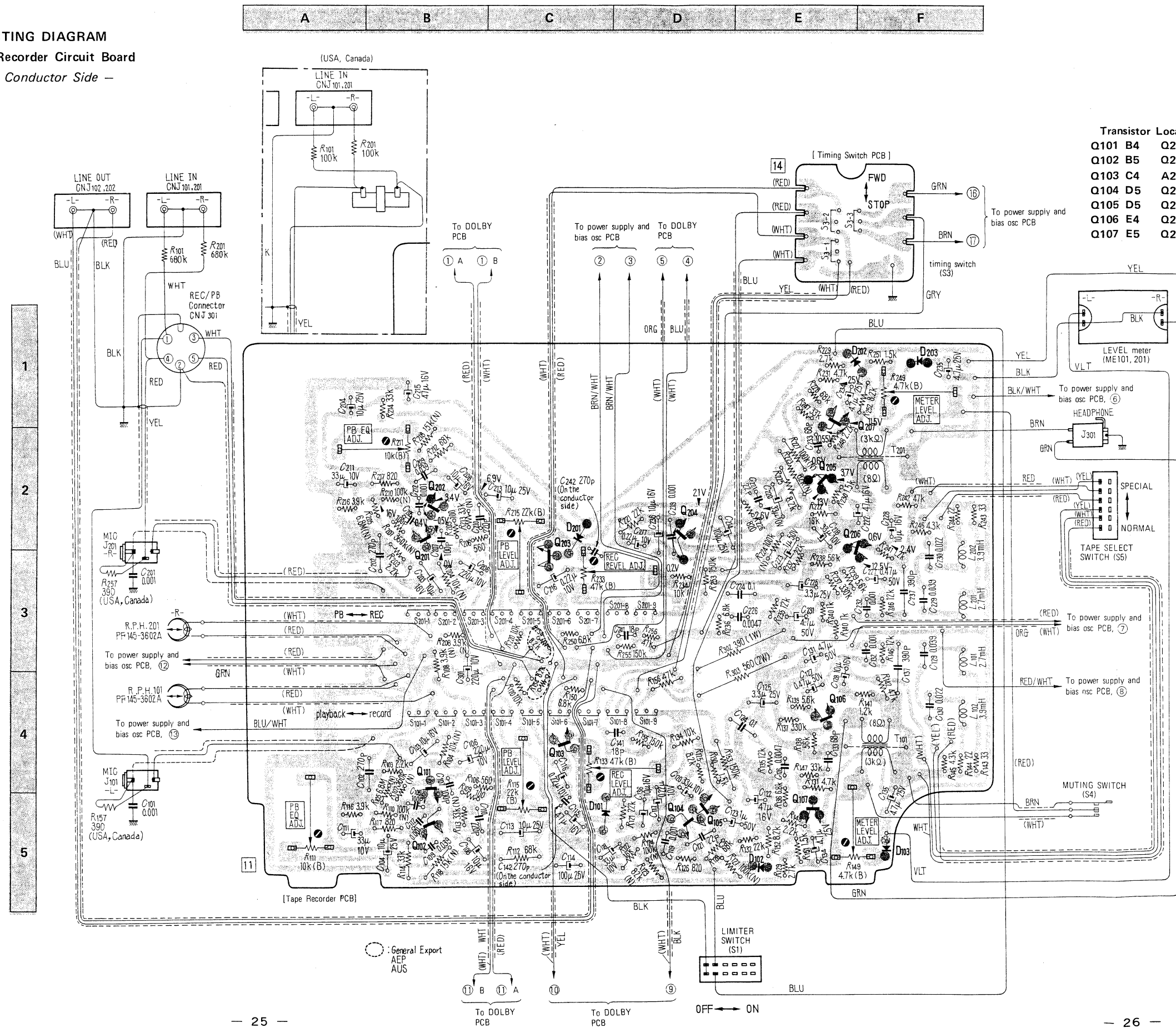
9. Switch mode

Ref. No.	Switch	Mode
S101, 201	record/playback	playback
S1-1, 1-2	LIMITER	OFF
S2	POWER	ON
S3-1 ~ 3-3	timing	playback
S4-1, 4-2	muting	OFF
S5-1, 5-2	TAPE SELECT	SPECIAL
S6-1 ~ 6-4	DOLBY	ON

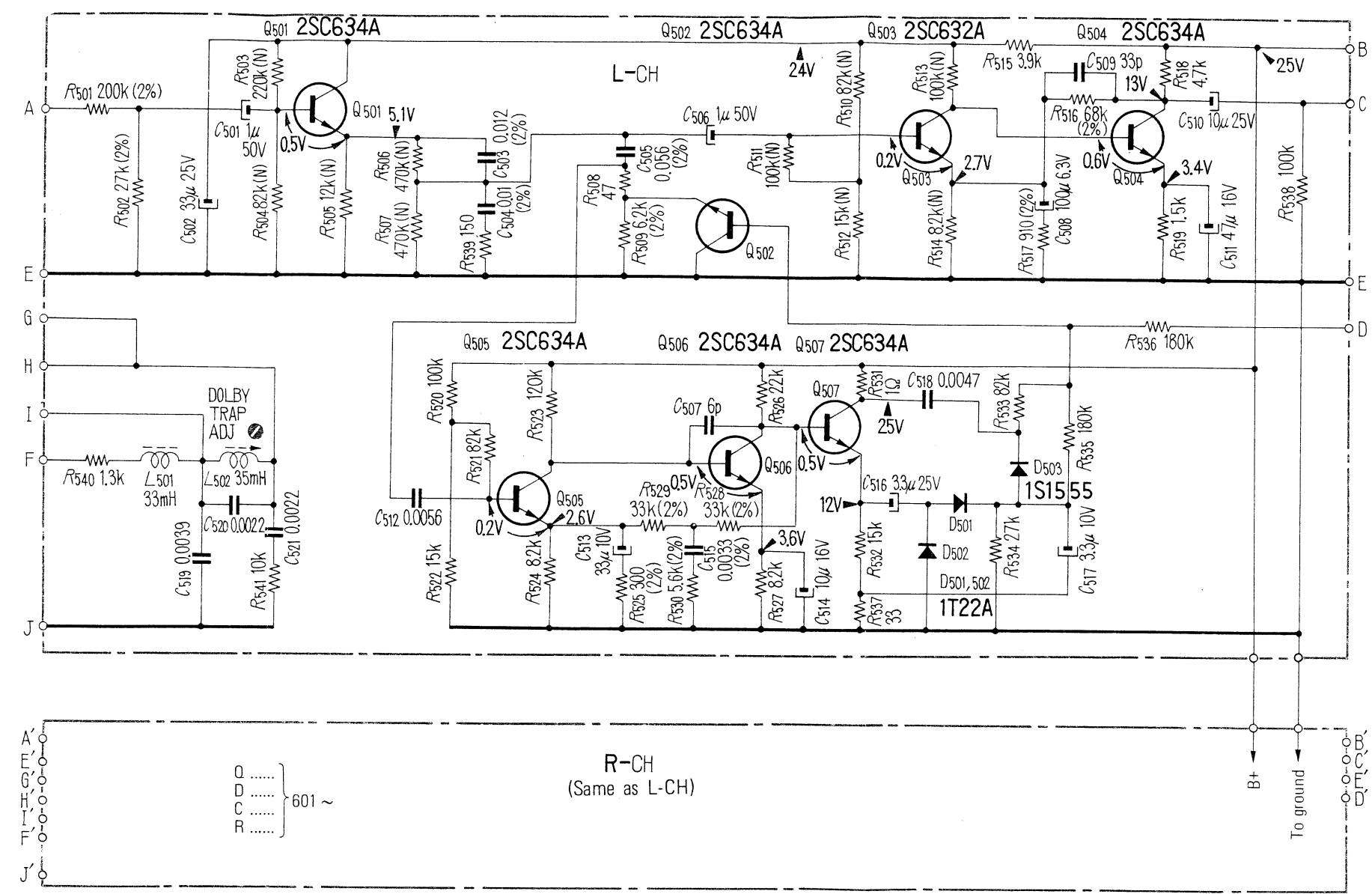
4-2. MOUNTING DIAGRAM

Tape Recorder Circuit Board

— Conductor Side —



4-3. SCHEMATIC DIAGRAM
DOLBY Circuit



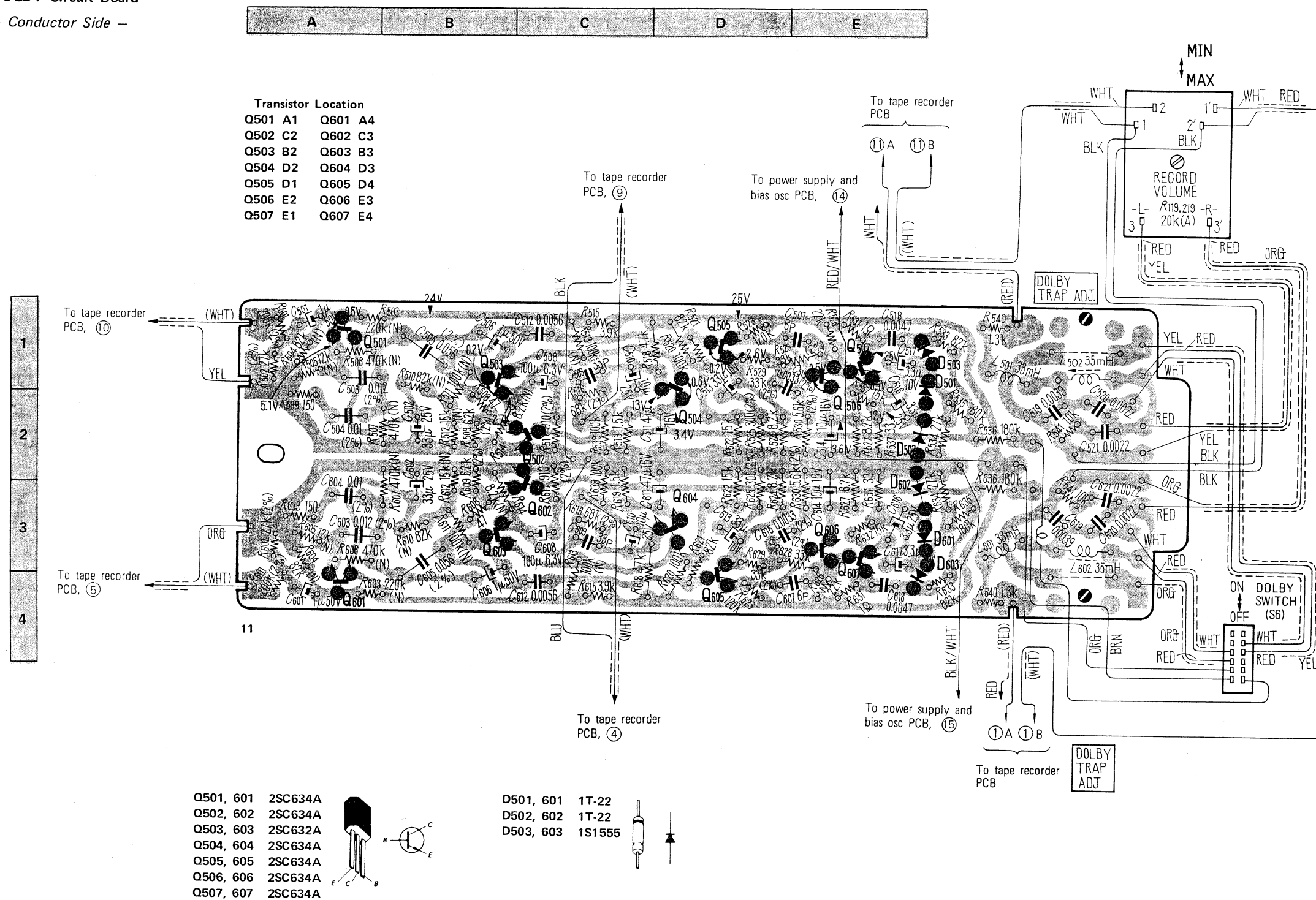
Note:
1. All resistors and capacitors are rated in Ω and μF unless otherwise indicated.
2. * indicates grounded to chassis.
3. The letters (A) and (B) suffixed to rating value of variable resistor indicate its characteristics.
4. The letter (N) which is suffixed to rating values shows a low-noise resistor.
5. Voltage values shown are measured with a voltmeter (20 k Ω /2V) in playback mode. Voltage values in parentheses are for record mode. Variations may be noted because of normal production tolerances.
6. adj - adjustable.
7. Components for R-CH are the same value as for L-CH.
8. When replacing resistors and capacitors specified with 2% tolerance, use the specified ones, since DOLBY system requires precise circuit operation.
2% Tolerance Identification

Diagram illustrating 2% tolerance identification. A resistor with a red dot indicates 2% tolerance (selected from resistor of 5% tolerance). A resistor with a gold band indicates 5% tolerance.

4.4. MOUNTING DIAGRAM

DOLBY Circuit Board

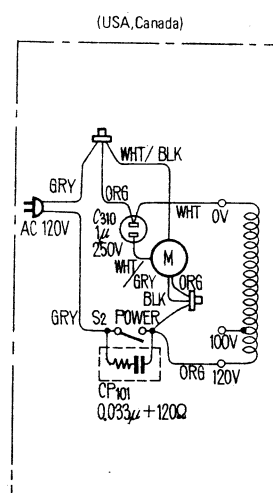
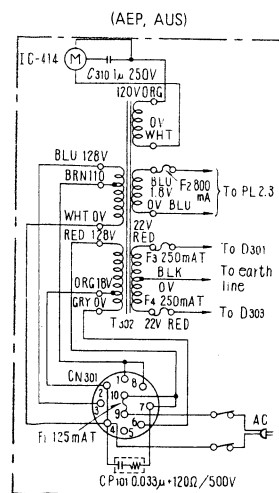
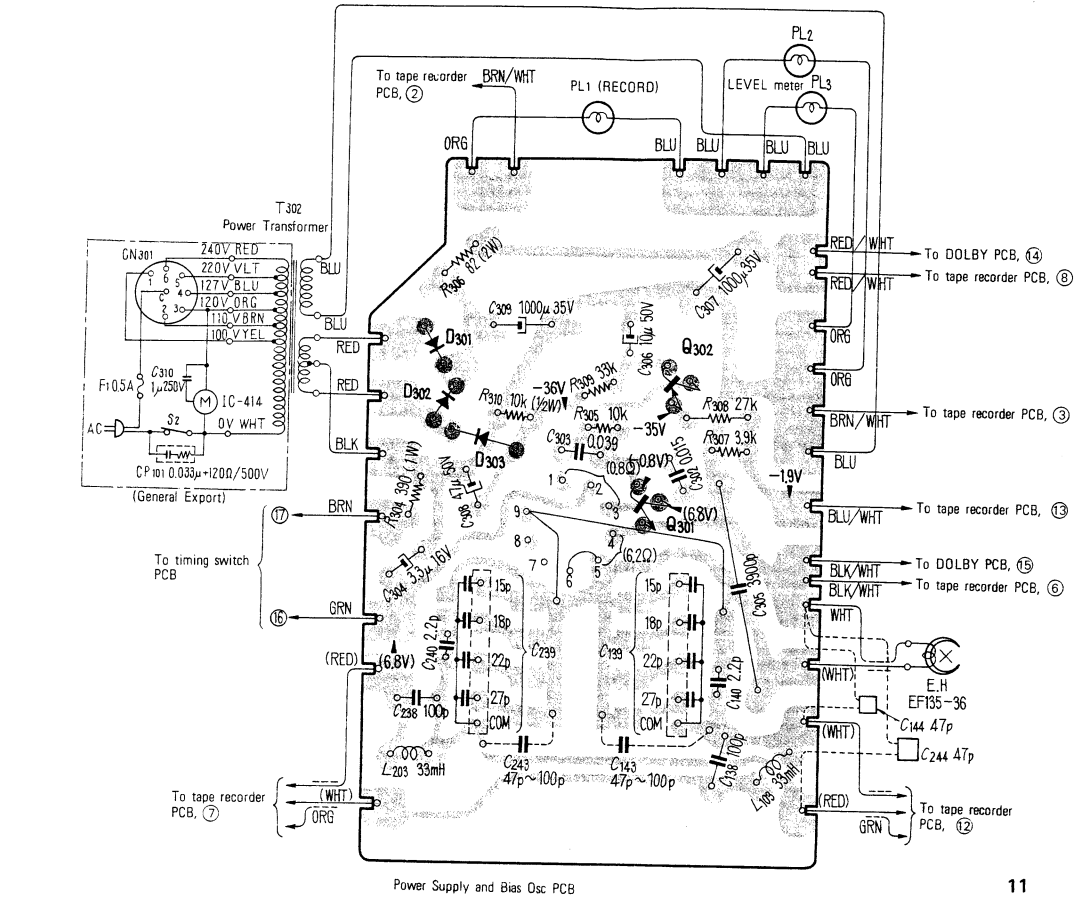
— Conductor Side —



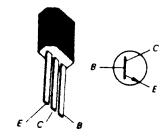
4-5. MOUNTING DIAGRAM

Power Supply and Bias Osc Circuit Board

– Conductor Side –

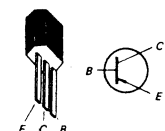


Q301 2SC633A



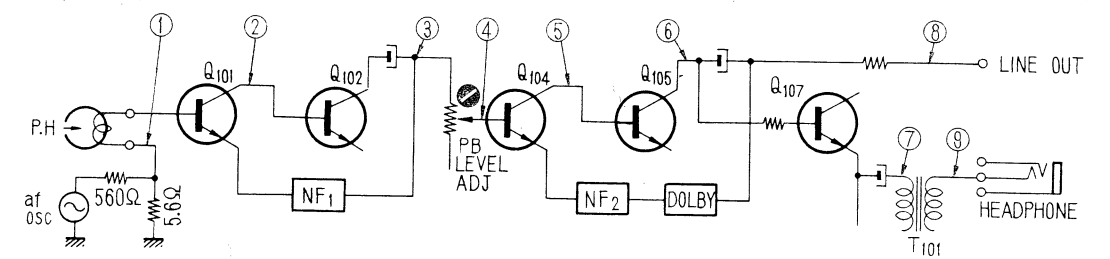
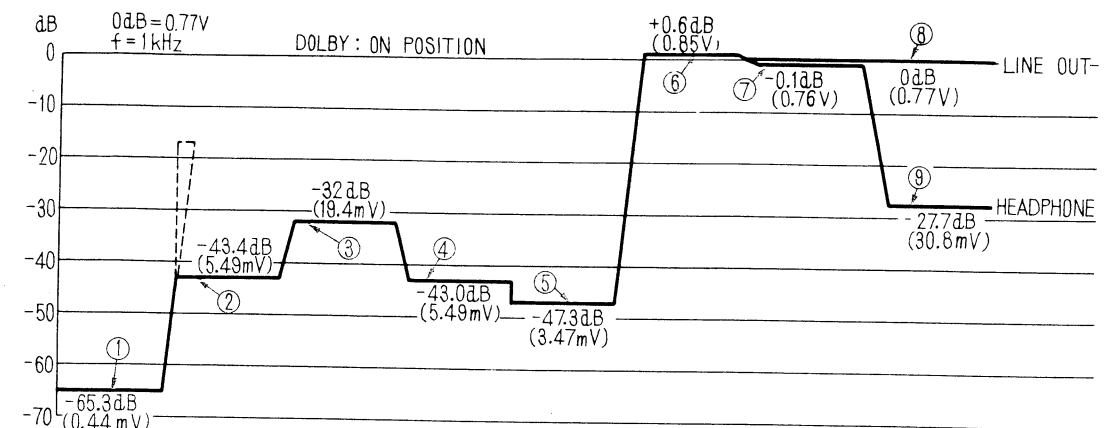
D301	10D-2
D302	10D-2
D303	10D-2

Q302 2SA678

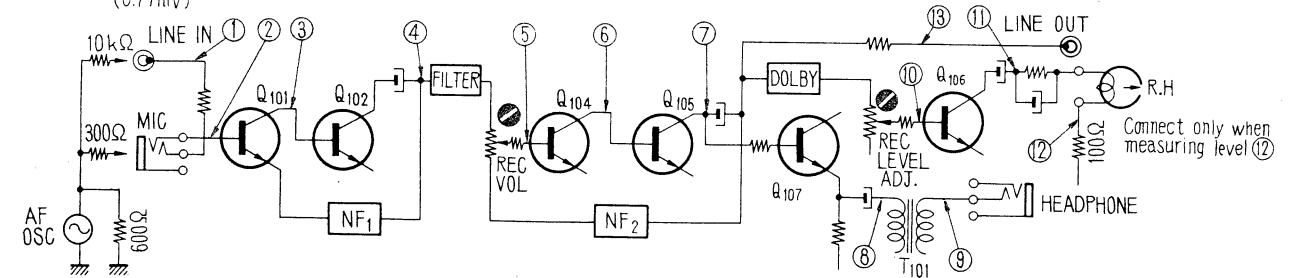
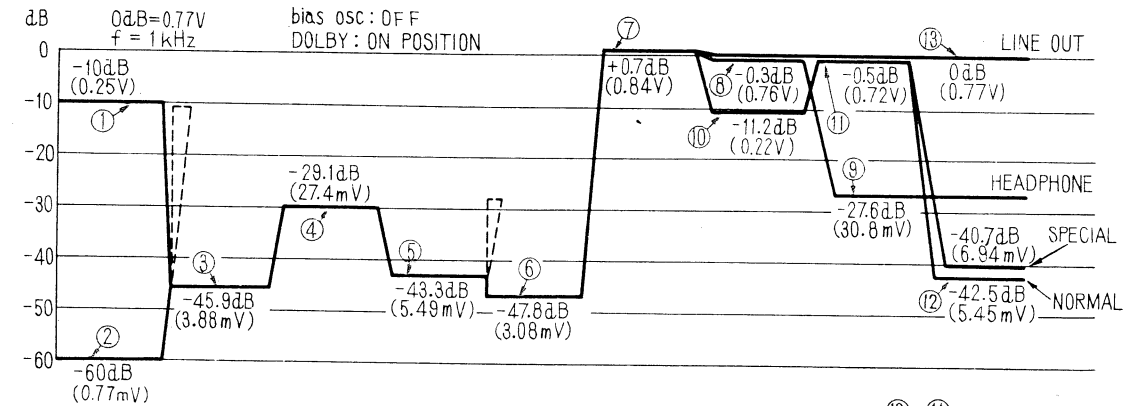


4-6. LEVEL DIAGRAM

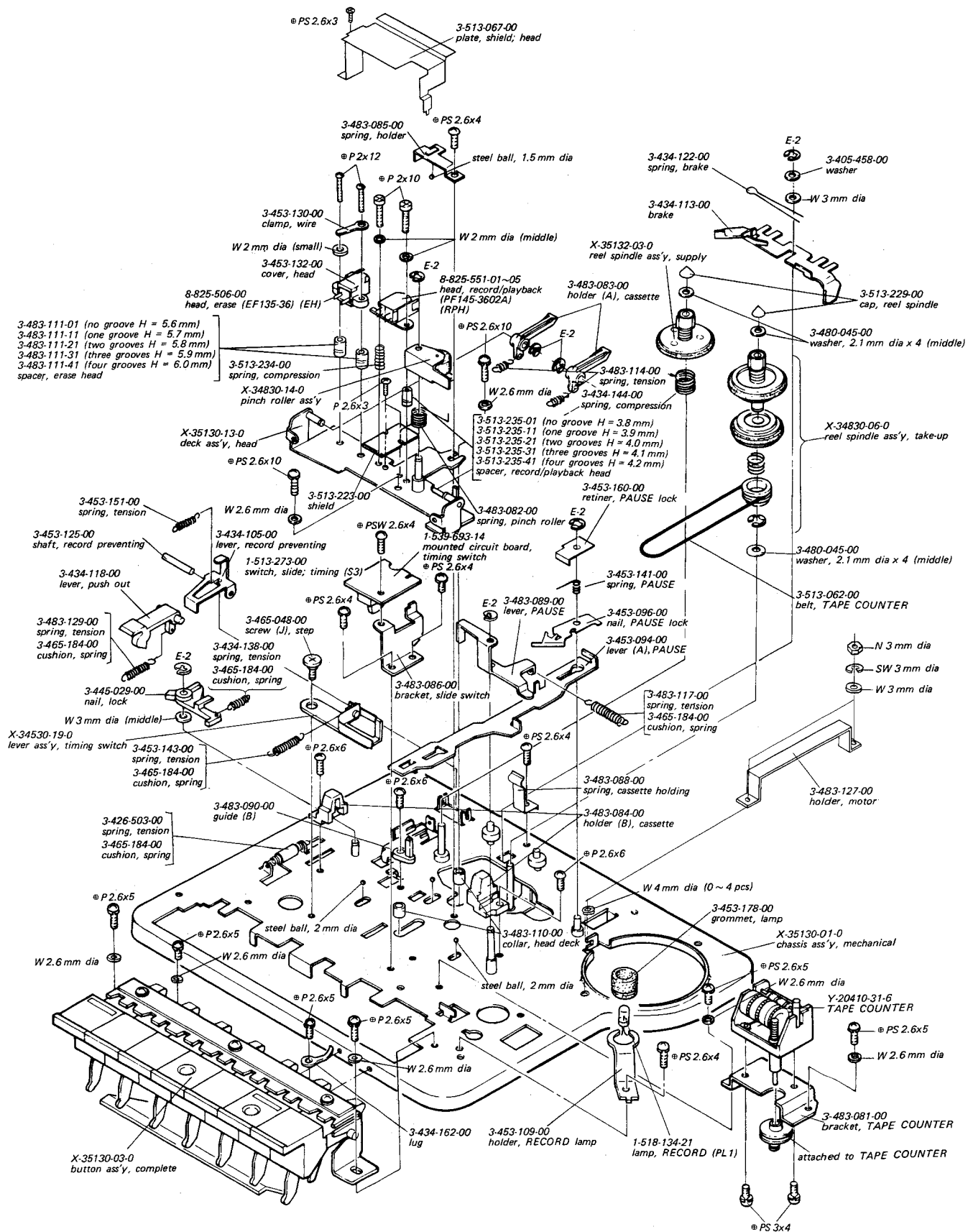
Playback



Record

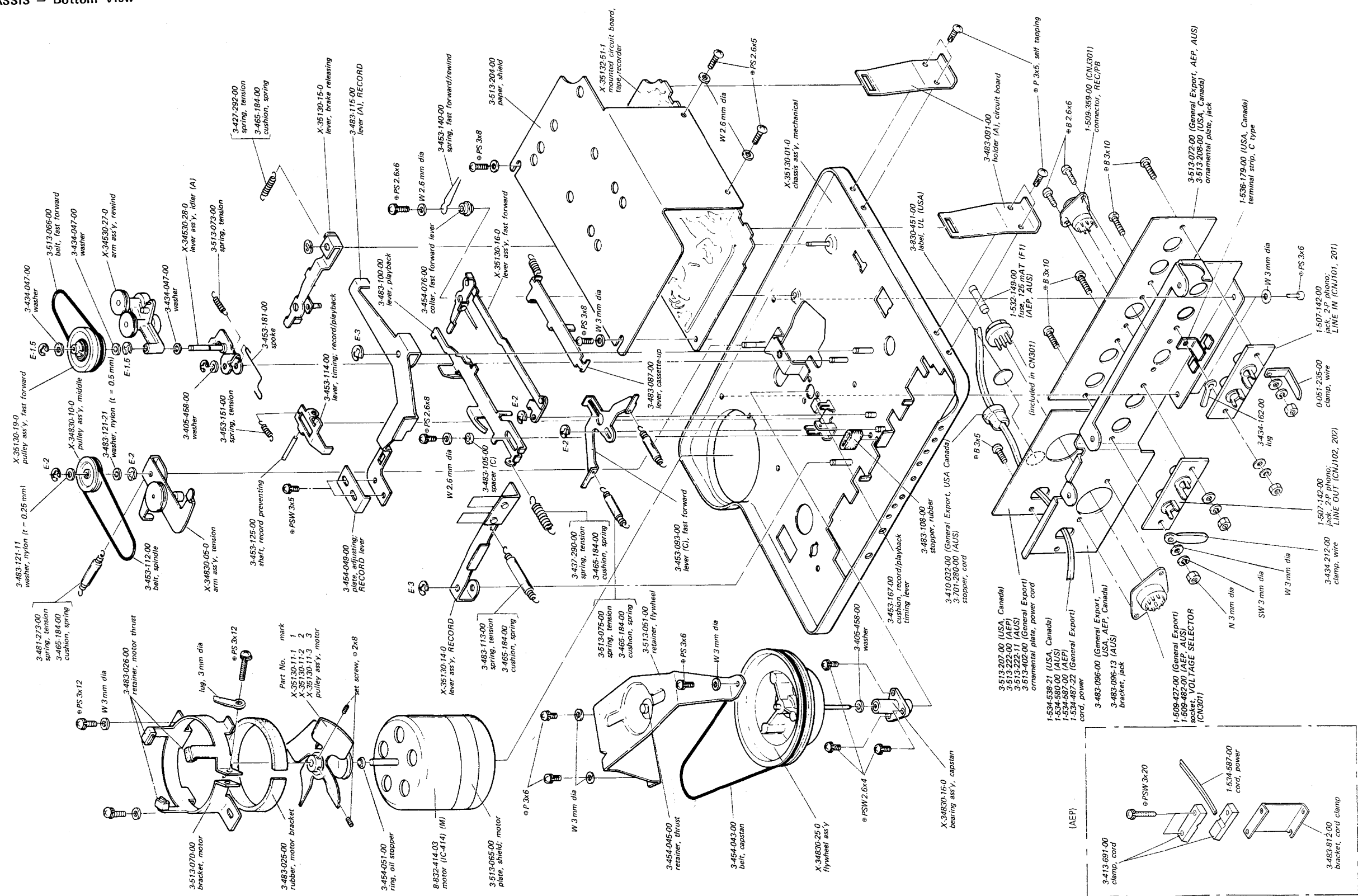


5-2. CHASSIS – Top View –



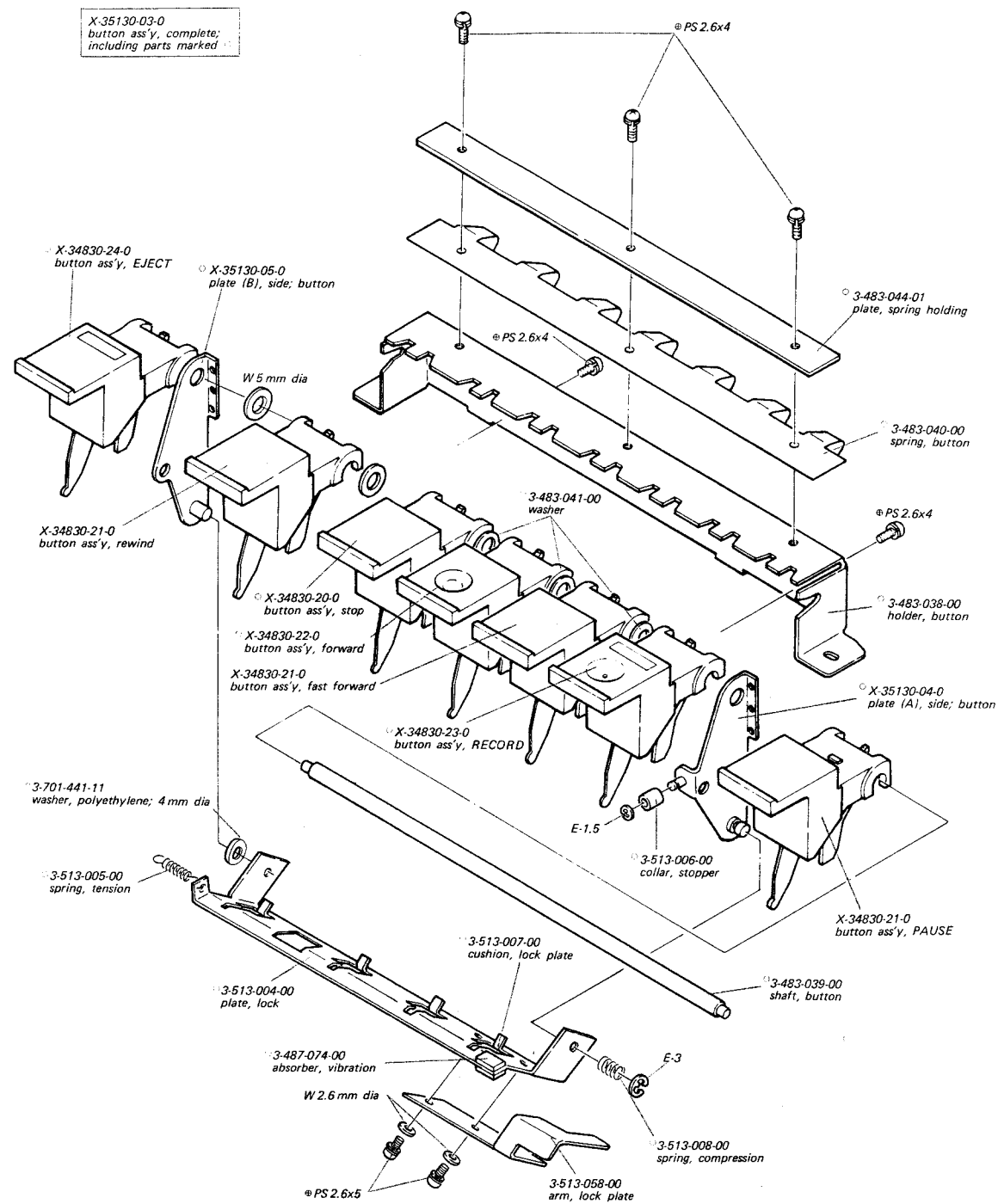
Note: Parts without part numbers and names are not available.

5-3. CHASSIS — Bottom View —



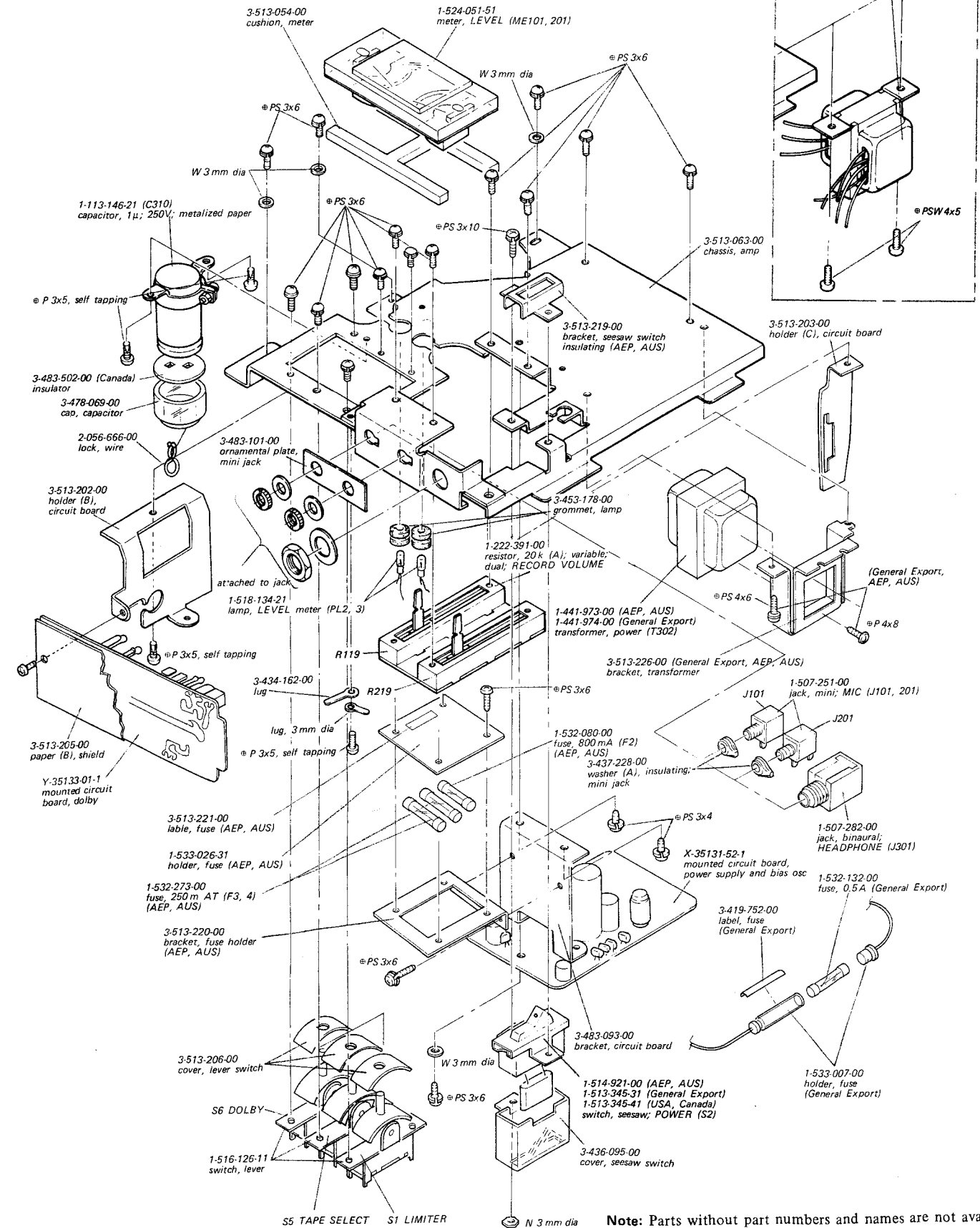
Note: 1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated. (-): slotted head

5-4. BUTTONS



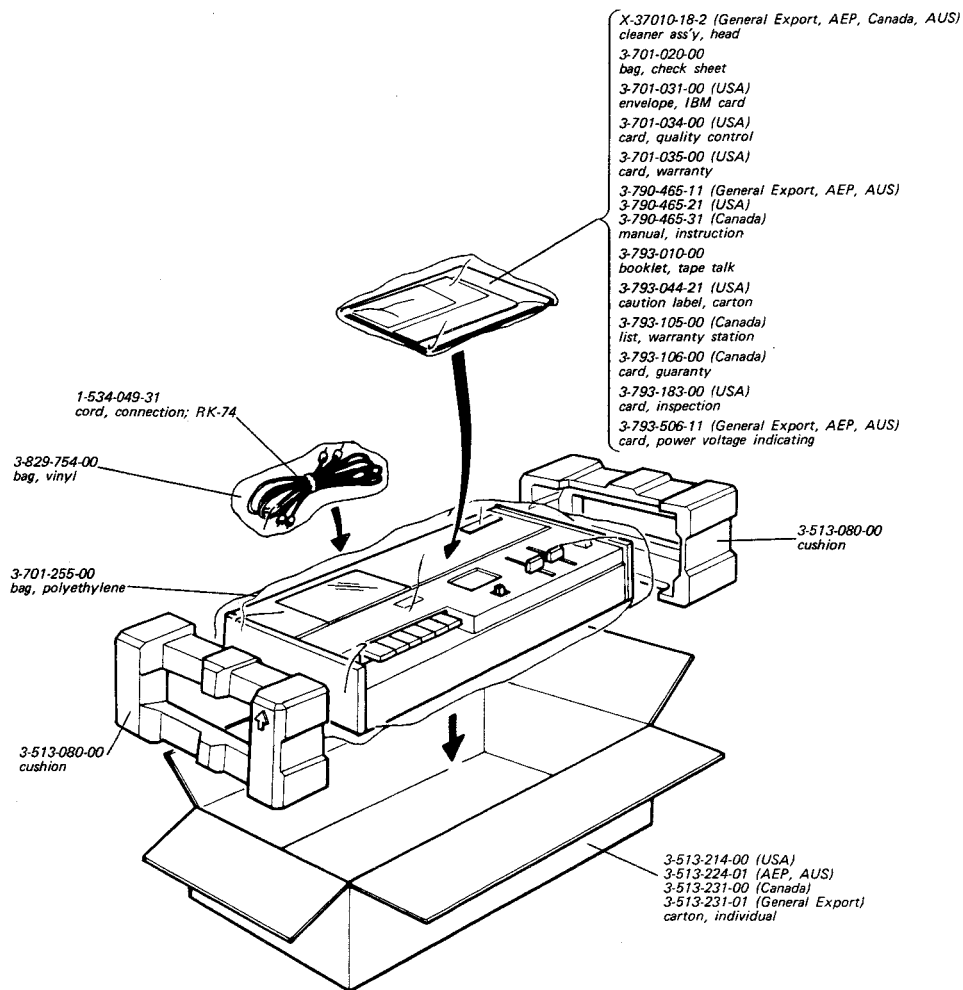
Note: Parts without part numbers and names are not available.

5-5. ELECTRICAL PARTS



Note: Parts without part numbers and names are not available.

5-7. PACKING



Note: Parts without part numbers and names are not available.

SECTION 6

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MOUNTED CIRCUIT BOARDS			CAPACITORS		
X-35132-51-1		tape recorder	All capacitors are in μF unless otherwise indicated. (p = $\mu\mu$, elect = electrolytic)		
X-35131-52-1		power supply and bias osc	C101, 201	1-105-821-12	0.001 50V mylar
Y-35133-01-1		DOLBY	C102, 202	1-107-095-11	270 p 50V silvered mica
SEMICONDUCTORS			C103, 203	1-121-469-11	10 16V elect
Q101, 201		transistor 2SC631A	C104, 204	1-121-398-11	10 25V elect
Q102, 202		transistor 2SC631A	C105, 205	1-107-131-11	100p 50V silvered mica
Q103, 203		transistor 2SC1384	C106, 206	1-121-420-11	220 10V elect
Q104, 204		transistor 2SC631A	C107, 207	1-107-131-11	100p 50V silvered mica
Q105, 205		transistor 2SC634A	C108, 208	1-121-469-11	10 16V elect
Q106, 206		transistor 2SC634A	C109, 209	1-105-680-12	0.039 50V mylar
Q107, 207		transistor 2SC634A	C110, 210	1-107-139-11	220p 50V silvered mica
Q301		transistor 2SC633A	C111, 211	1-121-402-11	33 10V elect
Q302		transistor 2SA678	C112, 212	1-105-821-12	0.001 50V mylar
Q501, 601		transistor 2SC634A	C113, 213	1-121-398-11	10 25V elect
Q502, 602		transistor 2SC634A	C114, 214	1-121-416-11	100 25V elect
Q503, 603		transistor 2SC632A	C115, 215	1-121-409-11	47 16V elect
Q504, 604		transistor 2SC634A	C116, 216	1-127-020-11	0.22 10V solid aluminum elect
Q505, 605		transistor 2SC634A	C117, 217	1-127-020-11	0.22 10V solid aluminum elect
Q506, 606		transistor 2SC634A	C118, 218	1-121-402-11	33 10V elect
Q507, 607		transistor 2SC634A	C119, 219	1-105-821-12	0.001 50V mylar
D101, 201		diode VO-6C	C120, 220	1-121-402-11	33 10V elect
D102, 202		diode 10D-05	C121, 221	1-107-119-11	22p 50V silvered mica
D103, 203		diode 1T-22	C122, 222	1-121-409-11	47 16V elect
D301		diode 10D-2	C123, 223	1-121-391-11	1 50V elect
D302		diode 10D-2	C124, 224	1-105-685-12	0.1 50V mylar
D303		diode 10D-2	C125, 225	1-121-392-11	3.3 25V elect
D501, 601		diode 1T-22	C126, 226	1-105-509-12	0.0047 50V mylar
D502, 602		diode 1T-22	C127, 227	1-121-726-11	0.47 50V elect
D503, 603		diode 1S1555	C128, 228	1-121-651-11	10 16V elect
COILS AND TRANSFORMERS			C129, 229	1-105-520-12	0.039 50V mylar
L101, 201	1-407-497-21	coil, micro inductor; 2.7 mH	C130, 230	1-105-515-12	0.022 50V mylar
L102, 202	1-407-499-21	coil, micro inductor; 3.9 mH	C131, 231	1-121-396-11	4.7 50V elect
L103, 203	1-407-212-00	coil, micro inductor; 33 mH	C132, 232	1-105-821-12	0.001 50V mylar
L501, 601	1-407-561-00	coil, micro inductor; 33 mH	C133, 233	1-107-127-11	68p 50V silvered mica
L502, 602	1-407-658-00	coil, variable inductor; 35 mH	C134, 234	1-121-395-11	4.7 25V elect
T101, 201	1-427-299-00	transformer, output	C135, 235	1-121-395-11	4.7 25V elect
T301	1-433-132-11	transformer, bias osc	C136, 236	1-121-651-11	10 16V elect
	1-441-838-21	transformer, power (USA)	C137, 237	1-107-060-11	390p 500V silvered mica
	1-441-973-00	transformer, power (AEP, AUS)	C138, 238	1-107-004-11	100p 500V silvered mica
T302	1-441-974-00	transformer, power (General Export)	C139, 239	1-107-253-11	15+18+22+27p 500V silvered mica
	1-442-054-00	transformer, power (Canada)	C140, 240	1-107-042-11	2.2p 500V silvered mica
			C141, 241	1-107-113-11	18p 50V silvered mica
			C142, 242	1-107-141-11	270p 50V silvered mica
				1-107-163-11	47 p 500V silvered mica
				1-107-164-11	51 p 500V silvered mica
				1-107-165-11	56 p 500V silvered mica
			C143, 243	1-107-166-11	62 p 500V silvered mica
				1-107-167-11	75 p 500V silvered mica
				1-107-168-11	91 p 500V silvered mica
				1-107-169-11	100 p 500V silvered mica
			C144, 244	1-107-015-11	47p 500V silvered mica
			C301	1-121-420-11	220 10V elect

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
C302	1-105-675-12	0.015	50V mylar	R118, 218	1-242-701-09	15 k	low noise
C303	1-105-680-12	0.039	50V mylar	R119, 219	1-222-391-00	20 k(A),	variable; dual; RECORD VOLUME
C304	1-127-206-11	3.3	16V solid aluminum elect	R120, 220	1-242-697-11	10 k	
C305	1-129-795-11	3,900p	500V polystyrol	R121, 221	1-242-705-11	22 k	
C306	1-121-738-11	10	50V elect	R122, 222	1-242-702-11	16 k	
C307	1-121-388-11	1,000	35V elect	R123, 223	1-242-719-09	82 k	low noise
C308	1-121-411-11	47	50V elect	R124, 224	1-242-721-09	100 k	low noise
C309	1-121-388-11	1,000	35V elect	R125, 225	1-242-695-11	8.2 k	
C310	1-113-146-21	1	250V metalized paper	R126, 226	1-242-671-11	820	
C501, 601	1-121-391-11	1	50V elect	R127, 227	1-242-721-09	100 k	low noise
C502, 602	1-121-404-11	33	25V elect	R128, 228	1-242-717-11	68 k	
C503, 603	1-129-896-21	0.012 ±2%	50V polyethylene	R129, 229	1-242-683-11	2.7 k	
C504, 604	1-129-701-21	0.01 ±2%	50V polyethylene	R130, 230	1-242-677-11	1.5 k	
C505, 605	1-105-522-12	0.056	50V mylar	R131, 231	1-242-689-11	4.7 k	
C506, 606	1-121-391-11	1	50V elect	R132, 232	1-242-705-11	22 k	
C507, 607	1-107-103-11	6p	50V silvered mica	R133, 233	1-222-776-00	47 k(B),	adjustable; record level adj.
C508, 608	1-121-413-11	100	6.3V elect	R134, 234	1-242-697-11	10 k	
C509, 609	1-107-119-11	56p	50V silvered mica	R135, 235	1-242-699-11	12 k	
C510, 610	1-121-398-11	10	25V elect	R136, 236	1-242-693-11	6.8 k	
C511, 611	1-121-409-11	47	16V elect	R137, 237	1-242-733-11	330 k	
C512, 612	1-105-670-12	0.0056	50V mylar	R138, 238	1-242-715-11	56 k	
C513, 613	1-121-402-11	33	10V elect	R139, 239	1-242-691-11	5.6 k	
C514, 614	1-121-651-11	10	16V elect	R140, 240	1-242-673-11	1 k	
C515, 615	1-129-794-21	0.0033 ±2%	50V polyethylene	R141, 241	1-242-675-11	1.2 k	
C516, 616	1-121-392-11	3.3	25V elect	R142, 242	1-242-713-11	47 k	
C517, 617	1-127-025-11	3.3	10V solid aluminum elect	R143, 243	1-242-637-11	33	
C518, 618	1-105-669-12	0.0047	50V mylar	R144, 244	1-242-633-11	22	
C519, 619	1-105-668-12	0.0039	50V mylar	R145, 245	1-242-688-11	4.3 k	
C520, 620	1-105-665-12	0.0022	50V mylar	R146, 246	1-242-699-11	12 k	
C521, 621	1-105-665-12	0.0022	50V mylar	R147, 247	1-242-709-11	33 k	
				R148, 248	1-242-681-11	2.2 k	
				R149, 249	1-222-773-00	4.7 k(B),	adjustable; LEVEL meter calibration
				R150, 250	1-242-693-11	6.8 k	
				R151, 251	1-242-677-11	1.5 k	
				R152, 252	1-242-695-11	8.2 k	
				R153, 253	1-210-857-11	150 k ±2%	
				R154, 254	1-242-695-11	8.2 k (General Export, AEP, AUS)	
				R155, 255	1-210-857-11	150 k ±2%	
				R156, 256	1-242-713-11	47 k	
				R157, 257	1-244-563-11	390 (USA, Canada)	
				R301		-----	
				R302	1-202-771-31	390 1W	composition
				R303	1-206-658-11	560 2W	metal oxide film
				R304	1-202-771-31	390 1W	composition
				R305	1-242-697-11	10 k	
				R306	1-206-485-11	82 2W	metal oxide film
				R307	1-242-687-11	3.9 k	
				R308	1-242-707-11	27 k	
				R309	1-242-709-11	33 k	
				R310	1-244-897-11	10 k ½W	
				R501, 601	1-242-858-11	200 k ±2%	
				R502, 602	1-210-854-11	27 k ±2%	
				R503, 603	1-242-729-09	220 k	low noise

RESISTORS

All resistors are ¼W, carbon type and in
Ω unless otherwise indicated.
(k = 1,000, M = 1,000,000)

R101, 201	1-244-741-11	680 k (General Export, AEP, AUS)
	1-244-721-11	100 k (USA, Canada)
R102, 202		-----
R103, 203	1-242-681-11	2.2 k
R104, 204	1-242-697-09	10 k low noise
R105, 205	1-210-832-11	6.8 M low noise
R106, 206	1-242-667-11	560
R107, 207	1-242-734-09	360 k low noise
R108, 208	1-242-689-09	3.9 k low noise
R109, 209	1-242-649-11	100
R110, 210	1-242-721-09	100 k
R111, 211	1-222-774-00	10 k(B), adjustable; playback equalizer adj.
R112, 212	1-242-717-11	68 k low noise
R113, 213	1-242-709-09	33 k
R114, 214	1-242-709-11	33 k
R115, 215	1-222-775-00	22 k(B), adjustable; playback level adj.
R116, 216	1-242-687-11	3.9 k
R117, 217	1-242-671-11	820

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R504, 604	1-242-719-09	82 k low noise
R505, 605	1-242-699-09	12 k low noise
R506, 606	1-242-737-09	470 k low noise
R507, 607	1-242-737-09	470 k low noise
R508, 608	1-242-642-11	51
R509, 609	1-210-853-11	6.2 k $\pm 2\%$
R510, 610	1-242-719-09	82 k low noise
R511, 611	1-242-721-09	100 k low noise
R512, 612	1-242-701-09	15 k low noise
R513, 613	1-242-719-11	82 k
R514, 614	1-242-695-09	8.2 k low noise
R515, 615	1-242-687-11	3.9 k
R516, 616	1-210-856-11	68 k $\pm 2\%$
R517, 617	1-210-851-11	910 $\pm 2\%$
R518, 618	1-242-689-11	4.7 k
R519, 619	1-242-677-11	1.5 k
R520, 620	1-242-721-11	100 k
R521, 621	1-242-719-11	82 k
R522, 622	1-242-701-11	15 k
R523, 623	1-242-723-11	120 k
R524, 624	1-242-695-11	8.2 k
R525, 625	1-210-850-11	300 $\pm 2\%$
R526, 626	1-242-705-11	22 k
R527, 627	1-242-695-11	8.2 k
R528, 628	1-210-855-11	33 k $\pm 2\%$
R529, 629	1-210-855-11	33 k $\pm 2\%$
R530, 630	1-210-852-11	5.6 k $\pm 2\%$
R531, 631	1-242-601-11	1
R532, 632	1-242-701-11	15 k
R533, 633	1-242-719-11	82 k
R534, 634	1-242-707-11	27 k
R535, 635	1-242-727-11	180 k
R536, 636	1-242-727-11	180 k
R537, 637	1-242-637-11	33
R538, 638	1-242-721-11	100 k
R539, 639	1-242-653-11	150
R540, 640	1-242-676-11	1.3 k
R541, 641	1-242-697-11	10 k

SWITCHES

S101, 201	1-514-813-22	slide, record/playback
S1	1-516-126-11	lever, LIMITER
S2	1-513-345-31	seesaw, POWER (General Export)
	1-513-345-41	seesaw, POWER (USA, Canada)
	1-514-921-00	seesaw, POWER (AEP, AUS)
S3	1-513-273-00	slide, timing
S4	1-514-117-00	leaf, muting

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
S5	1-516-126-11	lever, TAPE SELECT
S6	1-516-126-11	lever, DOLBY

JACKS

CNJ101	1-507-142-00	2-P phono, LINE IN
CNJ201		
CNJ102	1-507-142-00	2-P phono, LINE OUT
CNJ202		
CNJ301	1-509-359-00	connector, REC/PB (General Export, AEP, AUS)
J101, 201	1-507-251-00	mini, MIC
J301	1-507-282-00	binaural, HEADPHONE
CN301	1-509-427-00	socket, VOLTAGE SELECTOR (General Export)
	1-509-482-00	socket, VOLTAGE SELECTOR (AEP, AUS)

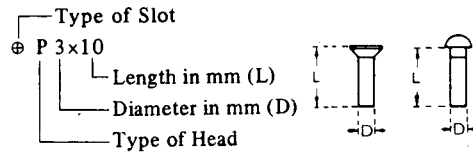
MISCELLANEOUS

EH	8-825-506-00	head, erase (EF-135-36)
RPH	8-825-551-01	head, record/playback
	~05	(PF145-3602A)
M	8-832-414-03	motor (IC-414)
PL1, 2, 3	1-518-134-21	lamp, LEVEL meter/RECORD
ME101, 201	1-524-051-51	meter, LEVEL
	1-534-487-22	cord, power (General Export)
	1-534-538-21	cord, power (USA, Canada)
	1-534-580-00	cord, power (AUS)
	1-534-587-00	cord, power (AEP)
CP101	1-231-057-12	encapsulated component, 0.033 μ F + 120 Ω 500V (General Export, AEP, AUS)
	1-231-057-31	encapsulated component, 0.033 μ F + 120 Ω 500V (USA, Canada)
	1-535-506-00	point, terminal
F1	1-532-132-00	fuse, 0.5A (General Export)
	1-532-149-00	fuse, 125 mA (AEP, AUS)
F2	1-532-080-00	fuse, 800 mA (AEP, AUS)
F3, 4	1-532-273-00	fuse, 250 mA (AEP, AUS)
	1-533-007	holder, fuse (General Export)
	1-533-026-31	holder, fuse (AEP, AUS)
	1-536-179-00	terminal strip, C type (USA, Canada)
	1-539-693-14	printed circuit board, timing switch

SECTION 7 HARDWARE

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
SCREWS		WASHERS	
7-621-259-15	⊕ P 2.6 × 3	7-623-105-02	2 mm dia (small)
7-621-259-25	⊕ P 2.6 × 4	7-623-105-12	2 mm dia (middle)
7-621-259-45	⊕ P 2.6 × 6	7-623-107-12	2.6 mm dia (middle)
7-621-771-38	⊕ B 2.6 × 8	7-623-108-12	3 mm dia (middle)
7-628-254-05	⊕ PS 2.6 × 5	7-623-110-02	4 mm dia (small)
7-628-254-15	⊕ PS 2.6 × 6	7-623-207-22	2.6 mm dia, spring
7-628-254-25	⊕ PS 2.6 × 8	7-623-208-22	3 mm dia, spring
7-628-254-35	⊕ PS 2.6 × 10		
7-682-128-01	⊕ RF 2 × 8	RETAINING RINGS	
7-682-129-01	⊕ P 2 × 12	7-624-102-01	E-1.5
7-682-228-01	⊕ P 2 × 10	7-624-104-01	E-2
7-682-546-14	⊕ B 3 × 5	7-624-106-01	E-3
7-682-548-14	⊕ B 3 × 8		
7-682-549-14	⊕ B 3 × 10	STEEL BALLS	
7-682-624-01	⊕ PS 2 × 4	7-671-111-11	1.5 mm dia
7-682-645-01	⊕ PS 3 × 4	7-671-112-01	2 mm dia
7-682-646-01	⊕ PS 3 × 5		
7-682-647-01	⊕ PS 3 × 6	MISCELLANEOUS	
7-682-648-01	⊕ PS 3 × 8	7-623-508-02	lug, 3 mm dia
7-682-649-01	⊕ PS 3 × 10	7-684-023-01	nut, 3 mm dia
7-682-650-01	⊕ PS 3 × 12		
7-682-959-01	⊕ PSW 4 × 5		
7-683-127-00	⊖ SC 2 × 4		
7-683-130-00	⊖ SC 2 × 8		
7-685-132-01	⊕ P 2.6 × 5, self tapping		
7-685-144-41	⊕ P 3 × 5, self tapping		
7-685-146-01	⊕ P 3 × 8, self tapping		

— Hardware Nomenclature —

P — Pan Head Screw		SC — Set Screw	
PS — Pan Head Screw with Spring Washer		E — Retaining Ring (E Washer)	
K — Flat Countersunk Head Screw		W — Washer	
B — Binding Head Screw		SW — Spring Washer	
RK — Oval Countersunk Head Screw		LW — Lock Washer	
T — Truss Head Screw		N — Nut	
R — Round Head Screw		— Example —	
F — Flat Fillister Head Screw			

Sony Corporation

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79F0615-7
Printed in Japan

STEREO CASSETTE-CORDER

TC-134SD

E Model
USA Model
AEP Model
Canada Model
AUS Model

CORRECTION

On Page 19

: corrected portion

No. 1

May, 1973

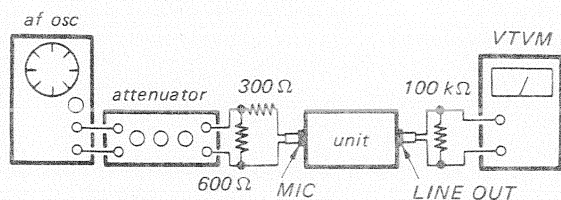
8. Overall Signal-to-noise Ratio Measurement

Control/Switch Setting:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY switch: OFF

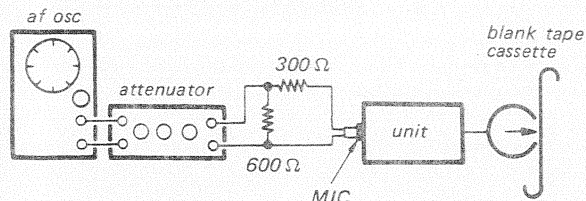
Procedure:

1. Mode: Record
333 Hz, -60 dB (0.78 mV)

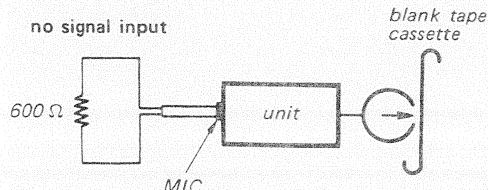


2. Set RECORD VOLUME control for 0 dB (0.77V) VTVM reading.

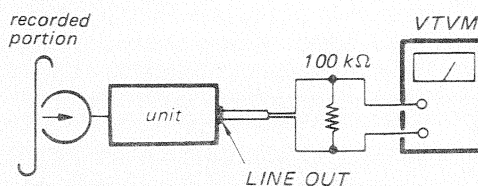
3. Mode: Record
333 Hz, -60 dB (0.78 mV)



4. Mode: Record



5. Mode: Playback



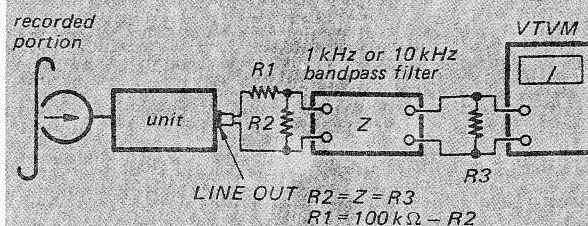
Play back	VTVM reading
333 Hz	0 dB (0.77 V)
no signal	less than -43 dB (5.49 mV)

6. Measure S/N ratio for 1 kHz and 10 kHz signals through 1 kHz and 10 kHz bandpass filters respectively according to Step 1 to 5.

Mode: record

Same as Steps 3 and 4.

Mode: playback



7. With DOLBY switch set to ON position, perform Step 6.

8. Ensure that DOLBY system improves S/N ratio.
S/N ratio should be improved:

5 dB or more at 1 kHz
8 dB or more at 10 kHz

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